RISC user

The magazine for users of Acorn RISC computers

JANUARY/FEBRUARY 1994
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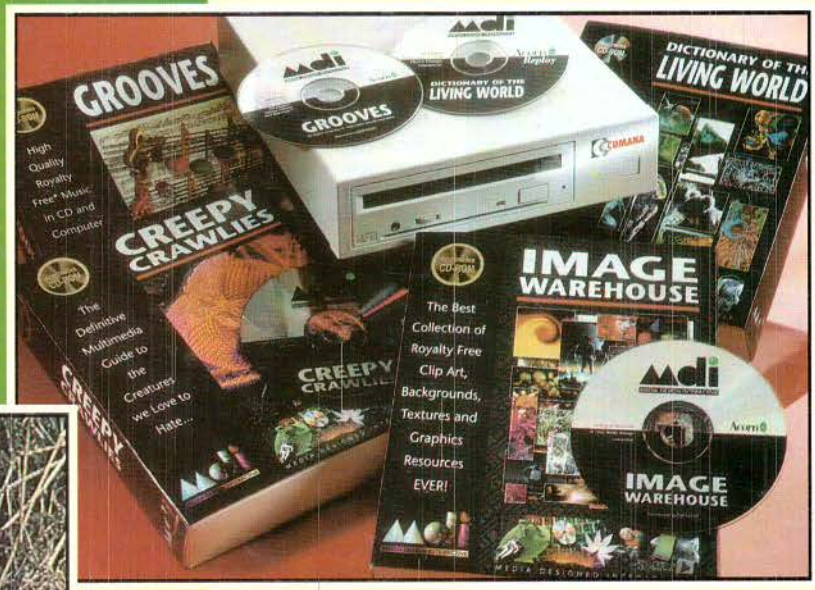
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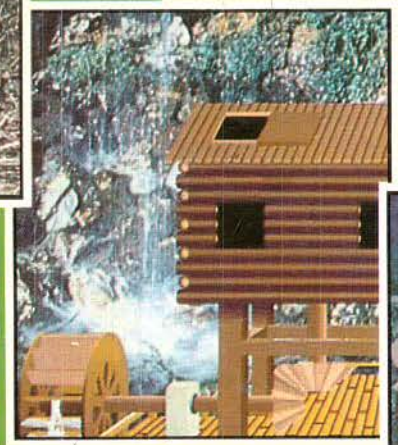

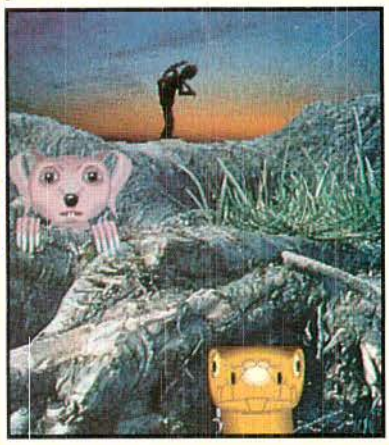

What's cooking at 4-Mation

The ARM7 Family

Impression Style

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THE MAGAZINE FOR USERS OF ACORN RISC COMPUTERS

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The start of a new year always seems like a good time to reflect on the previous twelve months, and to look ahead to the future.

For us, it has been very pleasing to see how many new readers have subscribed to RISC User over the last few months. We would very much like to welcome all these new readers to our pages. We hope you find the magazine enjoyable, entertaining and informative.

As far as Acorn is concerned, 1993 proved to be more a year of consolidation than innovation, though that may change in 1994. RISC OS 3 has become established as the current version for all Archimedes - indeed, if any readers have not yet upgraded, then I would urge them to do so as soon as possible. Users with older versions of RISC OS will increasingly find themselves cut off from new hardware and software developments, and even upgrades of existing software may no longer work properly under RISC OS 2 or earlier.

Acorn has upgraded and uprated its A5000 systems, and breathed yet more fire into the faintly glowing embers of its consumer market campaign. But there have been other good if less visible developments. Acorn achieved a number of tie-ups across Europe in the growing pre-press market (professional DTP), there are growing signs of acceptance of Acorn systems in the highly competitive games market, and Acorn has strengthened and expanded its overseas interests with a major sales mission to New Zealand and Australia in July, the establishment of Acorn's German subsidiary in October, and behind the scenes activity in support of Acorn Canada.

Most if not all of these developments depend heavily on co-operation and mutual support between Acorn and its partners: the well-known software and hardware developers. For many of them, particularly those which rely heavily on educational markets, 1993 was perhaps less satisfactory. The fragmentation of the schools market, exemplified by Local Management of Schools and 'opting out', together with an ever present shortage of money has led to fewer sales than many hoped for. Despite that, it seems to me that the Acorn market, in all areas, remains reasonably healthy and buoyant.

But what of the future? Far be it for me to enter the ranks of soothsayers and fortune tellers - that would be foolhardy. But what can we expect for 1994, and what challenges will emerge? Well, Acorn will launch a new machine, with a new RISC processor, and greatly improved colour handling. That much is already being taken for granted by the Acorn world. When? My guess is towards the middle of the year. The big question is what Acorn will do with its new power - will it be directed towards a new high-end replacement for the aged A540, or will it provide the low end of the market with amazing power and value for money. You and I will both have to wait and see.

I think Acorn is likely to continue making steady progress into those international and niche markets already identified above. However, all is not rosy. Other computer manufacturers do not sit idly by letting the likes of Acorn romp away with all the prizes. In the education market, while I do not see the same level of competition being sustained by Research Machines, Apple is beginning to make inroads, and has recently expanded its educational sales force to 14 in the UK. Given the significantly lower prices with which Apple is now aggressively marketing its range of computers, the power of the Apple Quadras and its newly announced PowerPC systems, there is a real threat from both the educational and the high-powered ends of the computer market. And the Apple systems support such highly regarded software as Quark Xpress, Adobe Illustrator and PhotoShop, Claris Works, and many more. While Acorn very much benefits from a loyal band of users, it will have to produce the very best hardware, and others the software, if the Archimedes is to maintain its position and reputation as one of the most innovative yet usable of readily available computer systems.

M.C.W.

Congratulations to our associate company, Beebug Ltd, on becoming Acorn's largest computer dealer. Beebug's policy is to match the price on any currently available product, while still offering service second to none.

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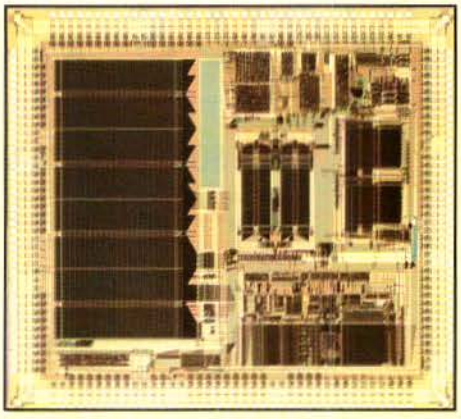

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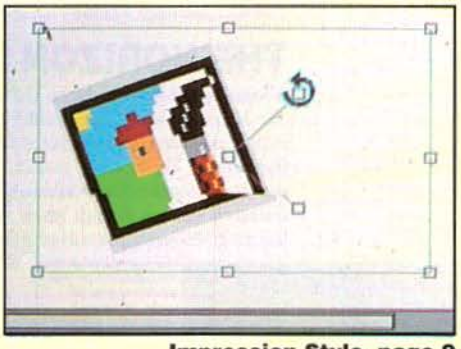

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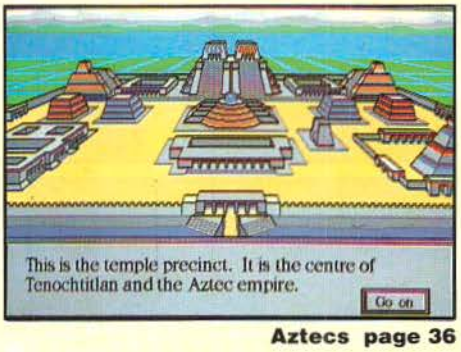

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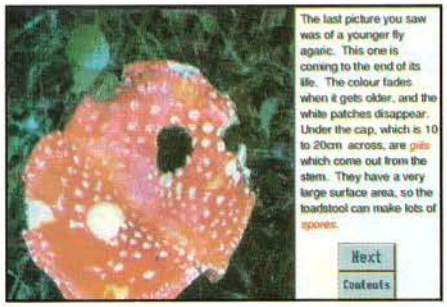
News ...

THE SOMERSET TALKING COMPUTER PROJECT

Longman Logotron has recently published a book entitled *The Somerset Talking Computer Project Learning Materials*. The Somerset Talking Computer Project involved finding ways to help children with reading and writing difficulties. The results of the project were quite phenomenal, showing an average increase in reading age of over 8 months, and a short term memory improvement of 16 months. *The Somerset Talking Computer Project Learning Materials* is a phonic-based pack of materials to be used in conjunction with Longman's Talking Pendown word processor, and includes a resumE of the project, the photocopiable phonic-based materials, advice on how to prepare, begin and proceed with the work, suggestions for monitoring progress, and ideas for extending the work with pupils. For more information, contact Longman Logotron at 124 Cambridge Science Park, Milton Road, Cambridge CB4 4ZS, tel. 0223 425558.

THE HORIZON PROJECT

A joint venture between Acorn and the Hampshire County Council, *The Horizon Project*, has resulted in the creation of over 80 new multimedia resource modules for all areas of the National Curriculum. The Horizon Project, which set out to explore how multimedia could enhance children's learning, and whether it offered teachers a medium through which they could develop teaching and learning resources, involved pupils and teachers in over 50 Hampshire schools.


The last picture you saw was of a younger fly agaric. This one is coming to the end of its life. The colour fades when it gets older, and the white patches disappear. Under the cap, which is 10 to 20cm across, are gills which come out from the stem. They have a very large surface area, so the toadstool can make lots of spores.
Next
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Notable examples of the project include *Minstead*, a geographical and environmental studies database created by 10 year old pupils at Isambard Brunel Middle School. Incorporating detailed information on mushrooms, toadstools and insect life, Minstead was specifically produced for the National Curriculum Science Attainment Level 3a, and also satisfies English Attainment Level 3f.

The Romans ate simple food . They ate bread stew, fish , nuts and herbs . They got their ideas about food from the lands they conquered . They ate meat garlic bread wine and fruit juice .
The Roman soldier carried his own quern with him so that he could grind corn to make bread.

Roman Soldier, produced by 7-9 year old pupils from Peel Common Junior School, focuses on the life of a Roman soldier, and includes information on food, clothing and religion in that period. Roman Soldier covers National Curriculum History Key Stage 2 Unit 1.

A full report on the Horizon Project is available from Acorn Computers, and includes case studies from many of the schools involved in the project, and conclusions about the successful use of multimedia in the classroom. A supporting CD-ROM containing all the projects and applications from the Horizon Project will soon be available, and a practical guide to using multimedia in the classroom will also be supplied to schools wishing to explore this exciting new medium.

Further details can be obtained from The Horizon Project, Hampshire Microtechnology Centre, Connaught Lane, Paulsgrove, Portsmouth, Hants PO2 7HX, tel. 0705 663444. Project details are also available from the Education Software Marketing Manager, Acorn Computers, Acorn House, Vision Park, Histon, Cambridge CB4 4AE, tel. 0223 254254.

EXTEND WITH SEMERC

Semerc has launched a robust new computer trolley which features a desktop surface that can be extended forward from 650mm to 800mm. Known as the Semerc E-x-t-e-n-d, the trolley was developed by the furniture specialist, Vari-Tech, and has been specifically designed to house 3-box computers such as the A4000S, the RM Nimbus 486, and the Apple LC3. The Semerc E-x-t-e-n-d Trolley costs £145 ex. VAT and £10 postage and packing. A version of the trolley with an integral 4-way power connector is available for an extra £20. For further information, contact Northwest Semerc, 1 Broadbent Road, Watersheddings, Oldham OL1 4HU, tel. 061 627 4469.

MORE FROM LONGMAN LOGOTRON

As if two new products aren't enough, Longman Logotron is also launching low cost DTP and spreadsheet packages.

Advantage is an entry-level spreadsheet aimed at any user who doesn't require the considerable power and flexibility of the more expensive spreadsheets such as *Eureka 2* and *Fireworkz*.

First Page, the desktop publishing package, provides a wide range of easy-to-use and intuitive tools that will help anyone to create impressive results.

Both Advantage and First Page should be available from the end of January for £49 ex. VAT each. And to round it all off, Longman has launched *Pinpoint for Windows*, a PC version of its popular data handling application.

For more information, contact Longman Logotron at 124 Cambridge Science Park, Milton Road, Cambridge CB4 4ZS, tel. 0223 425558.

AT LAST - MAC DISC COMPATIBILITY

Computer Concepts has announced that it is developing a utility that will give Archimedes users the ability to read and write Apple Macintosh discs. *MacFS* will be able to read and write to a variety of Mac formats, including SuperDrive floppies, external hard drives and SyQuest cartridges. It will be suitable for all models of the Archimedes with a high density disc drive and RISC OS 3.1. MacFS will retail at around £100, and Computer Concepts hopes to have it ready by April. For more information, contact Computer Concepts at Gaddesden Place, Hemel Hempstead, Herts HP2 6EX, tel. 0442 63933.

GREATER CONTROL WITH SEMERC ROLLER

Semerc has launched the Semerc Roller, an easy-to-use trackerball designed to help primary school children and those with poor motor control to move the cursor accurately around the computer screen. Used in conjunction with Semerc's Mouser, any of the Roller's buttons can be disabled, enabling teachers to simplify the negotiating of programs. The Semerc Roller costs £89 ex. VAT and £10 postage and packing, and is available from Northwest Semerc, 1 Broadbent Road, Watersheddings, Oldham OL1 4HU, tel. 061 627 4469.

ACORN & LONGMAN LAUNCH PIMS

Acorn and Longman Logotron have launched a new Primary Information Management System, PIMS for short. PIMS has been designed to address the complete administrative needs of primary schools, and provides a fully integrated system which manages and links all information relating to pupils and staff, budgeting and accounts, maintenance, insurance and inventory. For more information on PIMS, contact Acorn's free Education Hotline on 0800 400800 and ask for the Acorn Primary Admin Pack.

FROM DOS TO RISC OS TO DOS

Colton Software has completed a circle started almost seven years ago with the porting of PipeDream onto the Archimedes. It used BETT '94 to launch of its integrated word processor and spreadsheet, *Fireworkz*, for Windows on the PC. The PC version is almost identical to the RISC OS version, with the same user interface and menu structure, and files created on either system will be fully interchangeable and compatible. *Fireworkz* for Windows will be available at the same price as *Fireworkz* for RISC OS, £149 ex. VAT. For more information, contact Colton Software at 2 Signet Court, Swanns Road, Cambridge CB5 8LA, tel. 0223 311881.

SPHERES OF CHAOS

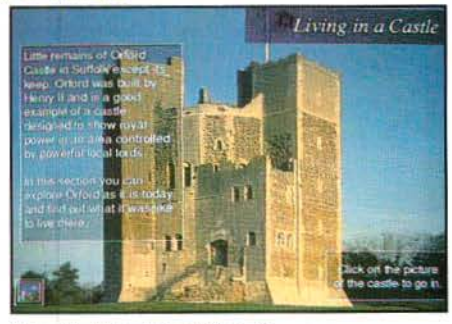
Matt Black has released new versions of its two popular action/arcade games. *Spheres of Chaos*, its highly successful space game, now includes five totally new types of alien, including Spinners, Pentagons, Reflectors and the deadly Superbugs. It's also been speeded up for ARM2/250-based machines, and has several new game configuration options, added at the request of the production company responsible for a well known TV computer game show. It's not beyond the realms of possibility that Spheres of Chaos might soon be making its debut on that programme!

Aggressor - Macho Edition is an entirely new version of the original Aggressor shoot-em-up. It features 8 totally new missions with tough mother aliens to beat, faster scrolling and animation, 8-directional fire, improved and simplified game controls, multi-level platforms to explore, and is Acorn joystick compatible.

Spheres of Chaos is priced at £24.99 inc. VAT, although existing owners can upgrade to the new version for £5 inc. VAT. Aggressor - Macho Edition costs £14.99 inc. VAT. Both games are available from Matt Black, P.O. Box 42, Peterborough, Cambridgeshire PE1 2TZ, tel. 0733 315439.

19TH CENTURY BIOGRAPHIES

Anglia Television also took advantage of BETT '94 to launch its new range of CD-ROM discs for the Archimedes. These include *Understanding the Body, Castles, 19th Century Biographies*, and two mapping discs, *Countries of the World, and Countries of Britain*. *Understanding the Body and Castles* are self-contained discs with libraries of still pictures, video sequences, vector-based graphics, animations and text, primarily aimed at the 11-14 age group.


Living in a Castle
Little remains of Orford Castle in Suffolk except its keep. Orford was built by Henry II and is a good example of a castle designed to show royal power in an area controlled by powerful local lords.
In this section you can explore Orford as it is today and find out what it was like to live there.
Click on the picture of the castle to go in.

Countries of the World and *Countries of Britain* are for use with Anglia's *Key Plus 3.0* data management system. Developed in association with mapmakers John Bartholomew, the two CD-ROMS allow interactive use of maps once restricted to the printed atlas. *19th Century Biographies* is the first *Key Plus* data file to be released on CD-ROM. Produced in association with the Hulton Deutsche Collection, over 250 lives, with more than 175 photographs, from the 19th Century are documented. For information on these products, contact Anglia at Anglia Television Media Development, Anglia House NR1 3JG, tel. 0603 615151.

ARM REACHES FOR THE SKY

ARM Ltd, designer of the ARM chip used in all Acorn 32-bit systems, has announced its latest licensing agreement, this time with Cirrus Logic Inc., a leading US supplier of integrated circuits for desktop, portable and mobile computing. Cirrus Logic thus becomes ARM's fifth semiconductor partner, complementing the strengths of VLSI Technology, GEC Plessey Semiconductors, Sharp Corporation and Texas Instruments. Under the terms of the agreement, Cirrus will use ARM7 RISC technology (see this month's feature on the ARM7 family) in embedded applications for consumer and business products including PDAs, advanced Smart cards and consumer multimedia.

Cirrus Logic believes that ARM RISC technology offers the most cost effective RISC processor currently available with its high performance, very low power consumption and small die size. ARM Ltd. is already shipping ARM610 processors for the Apple Newton, and the ARM700 is widely believed to power Acorn's next generation of 32-bit computer systems. Meanwhile, ARM Ltd., is currently working on the ARM800, which is expected to provide 120K Dhrystones at 70MHz by 1995/96, and then there's the ARM9 family to follow that.

ARM Ltd. is at Park End, Swaffham Bulbeck, Cambridge CB5 0NA, tel. 0223 813000, fax 0223 812800.

ARTWORK WITH A DIFFERENCE

The Macabre Art of Kerry Earl is the first of a new series of high quality graphic collections for the Archimedes. Lynsoft has signed licensing agreements with several popular artists in the science fiction, fantasy and horror spheres of small press publications, and is supplying their artwork in sprite format at £7.99 inc. VAT per disc, each containing around 30 compressed images. *The Macabre Art of Kerry Earl* comes on five discs, *The Fantasy Art of Russell Morgan* on three discs, and *The Graphic Art of Roger Morgan* on two. *The Graphic Illustrations of Jason Hurst* should be available from the beginning of February. For more information, contact Lynsoft at 32 Irvin Avenue, Saltburn-by-the-sea, Cleveland TS12 1QH, tel. 0287 624843.

MATHEMATICS BROUGHT TO LIFE

As mentioned in last month's news pages, Cumana is distributing the CD-ROM *The World of Number: Who Stole the Decimal Point?* with its Family Fun/Education Pack. The full World of Number CD-ROM series consists of four discs providing over 80 hours of classroom activities, and is designed for teaching Key Stage 3 and 4 students who find maths difficult or uninteresting. Titles in the series include *Number Games and Short Tasks, Picture Gallery, Who Stole the Decimal Point*, and *Perspectives*. The discs comprise a collection of tools, resources, games and exercises to enhance pupils' understanding of numerical concepts and to demonstrate the practical applications of mathematics. For more information, contact Cumana at Pines Trading Estate, Broad Street, Guildford, Surrey GU3 3BH, tel. 0483 503121.

KERNING FOR ALL

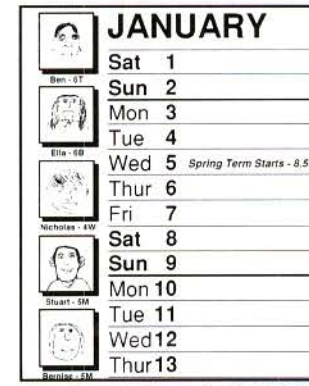
Kerner is a new utility from Design Concept that will allow you quickly and easily to convert your existing outline fonts to the new RISC OS 3 format, complete with full kerning information. With Kerner, you can either manually specify the letter pair to be kerned, or Kerner can automatically kern all the appropriate pairs. Kerner also provides full control over existing kerning and other font information, such as underline and descender positions. And since most current RISC OS 3 applications don't yet support kerning, Design Concept is also supplying an extra utility with Kerner, *Kern-All,* that will enable all applications to display and print kerned fonts. Kerner costs £15 inc. VAT and postage and packing, and is available from Design Concept at 30 South Oswald Road, Edinburgh EH9 2HG, tel. 031 668 2000.

UPGRADE YOUR IMPRESSION NOW

The Computer Concepts HQ at Gaddesden Place has recently been buried under a mountain of requests for upgrades to Impression Style and Impression Publisher. While doubts have been cast on the ability of the structure to hold so much paper, CC has made it clear that they still want to encourage all Impression users to apply for their upgrades as soon as possible. CC claims that they have intentionally set the upgrade price at £29 to encourage every single Impression user to upgrade - in six months time they don't want anyone to be left with the old Impression II or Junior.

In an effort to encourage customers to upgrade, Computer Concepts has announced that the £29 upgrade price has a limited life - four months after the release of Style they intend to raise the price of the upgrade to £50, with the same policy applying to Impression Publisher once it has been launched. The current upgrade price is £29 ex. VAT and postage and packing (£37.60 inc.). To order the upgrade, contact CC at Gaddesden Place, Hemel Hempstead, Herts HP2 6EX, tel. 0442 63933.

START THE NEW YEAR WITH OVATION



Newnham Junior School, Ruislip, Middlesex have sent us a copy of their 1994 calendar, produced entirely with RISC Developments' Ovation. The school has duplicated copies which it is hoping to sell to parents. Head teacher, Dave Kidner, says that, "One of the most useful features of the program is its ability to draw lines.... It would have been difficult to produce a master page like this using Impression". The school is at Newnham Avenue, Eastcote, Ruislip, Middlesex HA4 9RW.

Introducing the ARM7 Family

David Spencer looks at the latest addition to the ARM processor family.

There has been a lot of speculation in the Acorn world over the last few months about the new ARM700 processor from ARM Ltd, not least because it is widely expected to form the heart of the next generation of machines from Acorn. However, as we will see, ARM themselves see the ARM700 and its siblings in a much wider context.

THE ARM7 CORE

As with its predecessor, the ARM600, the ARM700 is just one of a family of planned processors centred around the core processor, which is termed the ARM7. This core doesn't actually exist as a physical entity, but rather as what is known as a macrocell on a chip design system. The ARM7 core can be pulled up and incorporated into a chip design, in much the same way as a conventional component can be incorporated into a printed circuit board design. This approach allows the ARM7 core to be easily, and cost effectively, integrated into more complex designs.

The actual ARM7 is remarkably similar to the original ARM2 processor used in the older Archimedes. There is however, the major enhancement of an extended address bus from 26 bits to 32 bits. This extends the potential addressing capability from 64Mbytes to 4Gbytes, which is a much more respectable figure by today's standards. Unfortunately, this change has a knock-on effect on the programmer's view of the processor, because the older systems used to combine both the 26-bit program counter and 6-bit status register in a single register, which is no longer possible with 32-bit addressing. To get around this potential problem, a number of operating modes are provided. In the simplest mode, the addressing range is restricted to that of the older ARMs, and the processor operates in a totally ARM2/3-compatible mode. In the next step up, addresses used to hold data (accessed by LDR, LDM etc.) can be 32-bits, but the program counter can only be 26-bits. Again this is compatible with the ARM2/3. In native ARM7 mode, a separate Current Processor Status Register (CPSR) is added to allow for a full 32-bit program counter. Two new instructions, MSR and MRS are added to allow the CPSR to be read and written.

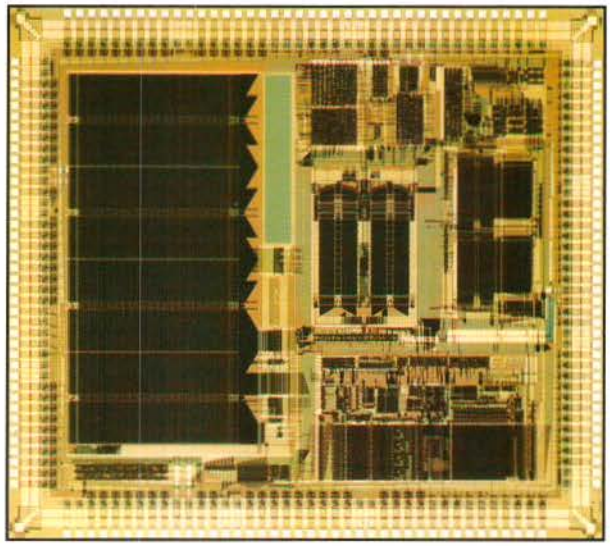
There are two other fairly trivial, but nonetheless important, changes to the ARM core. Firstly, it can now be configured to operate in big-endian as well as little-endian mode. This means that when a word is stored in memory, it is stored high-byte first rather than the current low-byte first format. This is the method used on Motorola processors and will aid porting of software from such systems. Secondly, two new operating modes have been added to handle undefined instructions and aborts. These will typically speed up system extensions such as the floating point emulator, and allow virtual memory to be implemented more efficiently.

THE ARM700 AND ARM710

The first ARM7 product, and the one of interest to Acorn users, is the ARM700, which Acorn are currently testing at a prototype stage. This is a chip consisting of the ARM7 core, a memory management unit (MMU), a cache, a write buffer and a co-processor interface. The MMU is the same sophisticated system implemented in the ARM600 and described in some detail in RISC User 5:4. Essentially, the MMU allows paging of memory as is possible with the current MEMC system, but extends this concept to allow for fast task-switching and multi-tasking operation. The cache is an extension of that found on the ARM3 and ARM600, providing 8K of storage instead of the current 4K. The write buffer, which first appeared on the ARM600, provides a mini-cache of just a few words for memory write cycles, whilst the co-processor interface allows connection of a number of external co-processors, for example a floating point unit.

The co-processor interface has been extended slightly to allow the co-processor to operate at a reduced clock speed compared to the main processor. This will allow complex co-processors

to be implemented in a cost effective manner. A version of the ARM700 without a co-processor interface is available as the ARM710. Unlike its big brother, which is a 160-pin chip, the ARM710 only has 144 pins, which helps reduce the cost.



The ARM700 die

The performance of the ARM700 is impressive. When powered from a 5v supply it can run at 33MHz, whilst it can maintain a clock speed of 20MHz from a 3v supply (such as in a battery powered application). These speeds correspond to performances of 52050 and 31546 Dhrystones per second respectively. This compares to 16779 Dhrystones per second on a 25MHz ARM3 - a three-fold increase. The ARM700 also performs very well in terms of power consumption, with the ARM7 core taking just 33mW when run at 20MHz with a 3v supply.

THE ARM7D AND ARM7DM

ARM Ltd have always been very keen to break away from the Acorn market and gain universal acceptance for their products. To this end ARM have signed marketing agreements with Sharp and Texas Instruments among other companies. The size of the ARM7 core makes it particularly suited for integrating with other building blocks to produce custom processors for specialist applications (the ARM7 core contains just 36510 transistors and occupies only six square millimetres of chip real-estate).

To make the ARM7 more attractive in this role, two variants have been designed. The first, the ARM7D adds a circuit called the *ICEBreaker* to the chip. The purpose of this is to implement an in-circuit emulator (ICE) to allow remote debugging of the processor and software. For example, a custom chip that contained an ARM7D buried deep inside it along with on-chip RAM and ROM could still be fully debugged with operations such as single-stepping, breakpoints and watch points. The actual debugging is performed using an external computer connected to the ARM7D through a unit called *BlackICE*.

The second variant, the ARM7DM, further extends the ARM7D by adding circuitry to turbo-charge the multiply and multiply-and-add instructions. This may seem a bit of a luxury, but many popular embedded controller applications these days involve digital signal processing (DSP). DSP is a generic term applied to operations such as digitising and encoding sound and video, digital filtering, encrypting data and advanced signal processing. All of these operations tend to require high-speed multiplication - hence the addition of the improved multiplier. The new system can multiply two 32-bit numbers in typically two cycles, and at most four, whereas the normal system takes up to sixteen cycles.

The first product to appear using these variants is the so-called ARM70DM which basically just takes the ARM7DM core and packages it in a 128-pin chip. However, as already said the main use of the ARM7D and ARM7DM will be in custom chips.

CONCLUSION

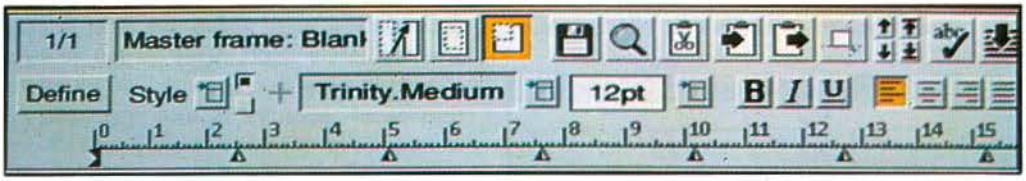
The ARM7 series is really only a modest progression from the ARM6 family of devices. However, as the ARM6 has never seen the light of day in an Acorn product, there will be a big jump from the current ARM3 A5000-type architecture to the expected next generation of machines which will probably use an ARM700, a VIDC20 and a replacement for the existing MEMC and IOC.

The introduction of the ARM7D and ARM7DM represents an important step in the direction of wider recognition of the ARM family in the real world. Such a move can only be beneficial to Acorn and its customers.

Impression Style

Richard Grant does it in Style with Computer Concepts' new word processor.

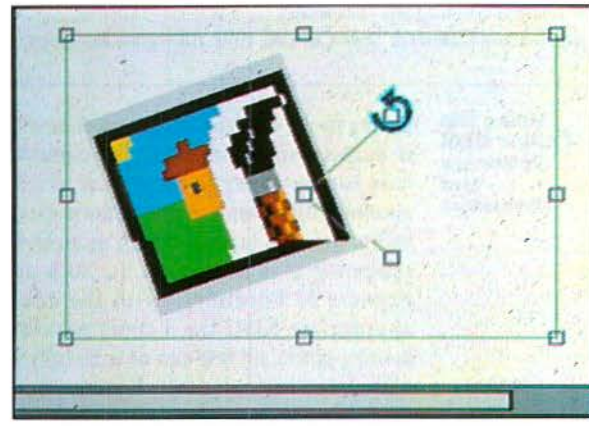
All computer software evolves and in the Acorn field that dictum is no exception to the rule. Having produced what some called the definitive DTP package for the Acorn range, Computer Concepts has now developed Impression into two different applications, *Impression Style* and *Impression Publisher*, both of which include a host of add-ons. In this short review, I will be looking specifically at Impression Style and its associated support features. It should be noted that the version I was supplied with was a pre-release beta version with a few known bugs, and there may be slight differences from the one that you ultimately buy from your dealer.



The new double button bar in Style

But firstly, what do you get for your money? It is becoming clear that Computer Concepts is developing Impression in two different but closely related directions. The old Impression II and Impression Junior, which we know so well, have become Style, a fully fledged *word processor*, whilst the new Publisher has more of the DTP feel to it, with features normally associated with *desktop publishing*, mainly involving fancy layout, graphics and colour separation for output. That's not to say that Style can't cope with such frills - it's just that it does it in a more prosaic manner, reminiscent of the style of Impression II.

So, to answer the question, you get a sophisticated word processor, a combined dictionary/thesaurus called WordWorks (based on the Collins GEM series), on-line help, Equasor (for producing mathematical and chemical equations), TableMate (for producing tables), and editing of embedded graphics using OLE, of which more later. In addition, you get an option to place a configurable on-screen button bar at the top of your window (see figure 1), this being perhaps the most visible immediate change. The button bar replicates almost the entire range of dialogue boxes by having a toggle button which swaps two lines of icons in and out, thus extending the range of icons available within a given screen width. In a way, the button bar copies an already established concept in the PC world - applications like WordPerfect have used a button bar for some time, as do some Archimedes applications now (e.g. the *Fireworkz* suite from Colton Software reviewed in this issue).

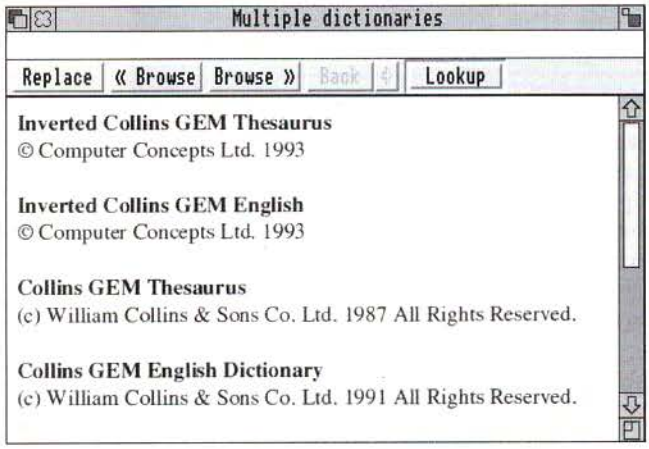


Manipulating a graphic - here by rotation

Fortunately for the regular Impression user, the look and feel of Style are similar to that of Impression II. Perhaps the main problem will be that some keyboard shortcuts have been rationalised and dialogue boxes redesigned, necessitating a new but probably short, learning curve. Notably, *Save* has now fallen into line with Acorn guidelines and is implemented through F3 rather than Ctrl-F3 as before. No doubt regular users will quickly learn these new keys.

OPTIONS AND FACILITIES

The facilities provided by Style can be divided into those which were there in Impression II and those which are new. Many of the original features have been improved in some way, for example, a graphics frame now has the integral ability to rotate, size and move the graphic within the frame (RISC OS 3 only) almost instantaneously with a simple click within the frame (figure 2) on what Computer Concepts calls the *Graphics Tool*. Some features remain the same but have been incorporated into menus in different places. Others have a different feel to them, for example, you can now open extra views (up to four, as before) on a document using Shift-Ctrl-F1 instead of having to use the icon bar menu. A new facility is auto-kerning. For years, Macintosh users have had the ability to output text which kerns automatically, but we poor Acorn users have had to accept a manual option up to now, thus relegating it to occasional use such as large banners or headlines. With the advent of appropriate RISC OS 3 fonts with built-in kerning tables, all text can now be fully kerned with no additional effort. I cannot but think that this will help the Acorn platform into many typesetting offices.


Multiple dictionaries
Replace
« Browse
Browse »
Back
Lookup
Inverted Collins GEM Thesaurus
© Computer Concepts Ltd. 1993
Inverted Collins GEM English
© Computer Concepts Ltd. 1993
Collins GEM Thesaurus
(c) William Collins & Sons Co. Ltd. 1987 All Rights Reserved.
Collins GEM English Dictionary
(c) William Collins & Sons Co. Ltd. 1991 All Rights Reserved.

Using the Collins GEM dictionary and Thesaurus

I found most of the new facilities intuitive, many of them are the sort of thing I wished the original Impression II had had from the outset. To give some examples, they include an edit option to automatically add a header or footer frame to a page, perhaps for a footnote. And at last, a facility for *Drag* and *Drop* is present where a highlighted section of text can be moved about a document with a couple of simple mouse clicks.

Mostly, the new additions occur in the last two menu options, *Utilities* and *Help*. Looking at *Utilities* first, we have many of the same options as before, but with additional enhancements: *Spelling* contains a new sub-option, that of *Thesaurus*. *Insert Menu* now has new options for page numbering, with *Initial Number* for starting a document and *Subsequent Number* for continuing it. There are also *Number Region* and *Delete Number* options which will automatically number paragraphs for an instruction manual or parts list, say.

A small, but useful new option is *Save as Default*. Basically, once you have created a document you would wish to use as the default, Style will save it automatically for you, through a safety *Warning Box*, as the default. I have my reservations about this as, with experience, we all tend to click our way through Warning Boxes without bothering to read them, and I could see an inexperienced user overwriting his default document by accident. I would much rather retain the old way of saving a default document which required active intervention on the part of the user, but I suppose this is just a small niggly point (isn't that what backups are for?).

The last new menu option is *Help* which offers four main sub-options, *Contents, Basic, Glossary* and *Index* and a direct link to Acorn's own interactive Help. These first four options are stunningly clever, and clicking on any one of these when WordWorks is loaded opens a new *Thesaurus* window with a pageful of useful information. Some of the words on this window are highlighted in green, and clicking on any of these words will bring up another page of help, I will describe the Thesaurus more fully in a moment. The extent of the help seems almost endless, and you can browse through many pages finding out exactly what you want to know. The days of endless flipping pages in a manual to find out just how to implement an obscure and rarely used function are now over, mercifully.

THAT OLE BLACK MAGIC

OLE, Object Linking and Embedding, or On Line Editing, as I have dubbed it, is a new concept that really does make life easier if you are writing a document which requires embedded graphics, in that you can effectively edit the graphic from within Style. Up till now, you would have had to export the graphic to

its originating program, perform your editing there and re-import it into your document. In essence, OLE operates by Ctrl-double-clicking in the graphics frame, and as long as the Filer has "seen" the whereabouts of the relevant graphics program, the graphic will be loaded into it with all its normal facilities. When you are finished, you close or exit from the program in the usual way and the updated graphic is automatically reloaded back into the original frame in your Style document. In this way, you can "actively" edit a graphic, and by saving it regularly, watch it develop in Style and relate it to your text in near real-time.

THE THESAURUS

Computer Concepts' thesaurus is definitely the most advanced that you will find on the Archimedes. In it, or perhaps, from it, you get a complete Collins GEM English Dictionary, GEM Thesaurus and the aforementioned Impression hypertext helpline. Its method of use is blindingly easy - the short glossy manual that comes with it being totally superfluous (but full marks to CC for still producing it). You highlight a word in your text, and immediately the word appears on the top line of the thesaurus window and depending which or all of the three options (dictionary, thesaurus, helpline) you have installed, the appropriate entries appear on screen. Simply select the word you want in the WordWorks window, and by clicking on *Replace* on the button bar, hey presto, your word appears in your text. It couldn't be easier. In addition, you can specify the text effects and size for the window, browse forwards and backwards through the words you have already looked at (in case the word that you want was two screens back), save frames of definitions and open a second view. It couldn't be easier. Options that might have been included are phrase anticipation and grammar checking, but maybe they're for the future.

ON THE TABLE

It is acknowledged that some Impression users have suffered difficulties in producing tables from within Impression. It is true to say that to do so requires a complete understanding of the Style Editor and this could explain the problems. However, over the horizon gallops TableMate, like the cavalry in blue. TableMate, as its name suggests, is essentially a Style Editor to produce tables which, when finished, can be saved directly into Style.

The other product that you get with Style is Equasor. This has been on the market for some time now and need not be described other than to say, for the benefit of those who have not seen it, that it is a program which will allow you to produce scientific or mathematical equations with consummate ease. Equasor allows you to "export" its output in Draw file format and this can then be dropped into a Style frame to achieve a very professional appearance. Both TableMate and Equasor have been reviewed previously in RISC User - 6:8 and 4:10 respectively).

PRODUCT INFO

Product	*Impression Style*
Supplier	*Computer Concepts* *Gaddesden Place,* *Hemel Hempstead,* *Herts HP2 6EX.* *Tel. 0442 63933* *Fax 0442 231632*
Price	*£99 ex. VAT* *Upgrades from Impression II or Impression Junior* *£29 ex. VAT, £37.60 inc. VAT and carriage (price valid for four months from release).*

Finally, many potential users will be delighted that the manual, which now comes as a spiral bound volume, is much improved in its usefulness - the new one abounds with simple explanations and a vast number of illustrations. Three cheers!

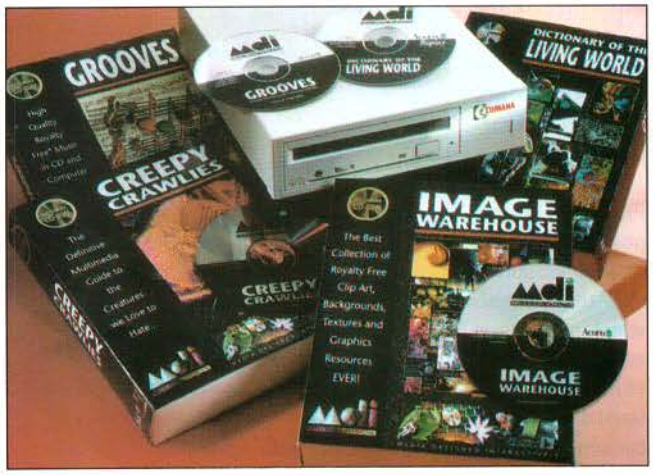
THE BOTTOM LINE

As you will see from the above, I am greatly enamoured with this product. It is the natural extension of Impression II (which I use regularly), and comes with a whole host of extra goodies each of which would cost the price of Style were it for a PC platform. Whether you are a writer or merely the producer of the occasional letter, Style offers nearly everything that a word processor should offer, and at a price that cannot be ignored. Whether you are upgrading from a lower version of Impression or buying anew, if you don't want or need the complexities of an out and out DTP package like Publisher, Style is a "must".

Two CD-ROM Systems

Alan Bonsor faces the difficult task of choosing between two attractively priced CD-ROM drives from Morley and Cumana.

Unlike RISC OS software, which has until recently been considerably cheaper than comparable applications on the Macintosh and PC, the opposite has usually been true for hardware, and CD-ROM drives have been no exception. It's not as if the hardware is any different - a CD-ROM drive



Cumana's "300 Series" CD-ROM

is a CD-ROM drive, no matter what computer you use it on. What pushes the prices up is not the drive itself, but rather the added expense involved in connecting it to the Archimedes. Most CD-ROM drives connect to the Arc via SCSI (Small Computer Systems Interface), and suitable SCSI cards are not particularly cheap. What has been needed for some time is a low cost CD-ROM drive and interface for the Arc, and now Morley and Cumana have both come up with the goods at the same time, using proprietary SLCD (Single Low Cost Drive) interfaces, and at very similar prices. So how well do they work, and which one should you go for?

FIRST IMPRESSIONS

The following might seem to be a fairly trivial point, but it has an important bearing on how you and I as consumers view a product. Morley has called its CD-ROM system the *Revolution*, while Cumana's is simply a *300 Series* CD-ROM drive. Which product sounds more impressive? Continuing with presentation, the documentation supplied with both systems contains almost identical information, yet Morley has gone to the effort of having an instruction manual professionally printed, while Cumana simply supplies several photocopied pages stapled together in booklet form. Considering that Morley's system is the cheaper of the two, Morley definitely wins the prize for presentation!

I have another gripe about Cumana's system. Both CD-ROM drives come in very similar Macintosh-grey boxes, with audio connectors on the front and back, volume control for audio CDs, and caddy-less drive units associated more with music CD players than CD-ROM drives. Yet while the Revolution has standard power and data cable connectors on the back, the cables for Cumana's drive are hardwired to the unit. This wouldn't be a problem - in fact it should make installation far easier for the non-technically minded user - if it weren't for the fact that the data cable is ridiculously short. On my Archimedes A410, and likewise with A300 and A540 systems, you have to install Cumana's interface card in an expansion slot on the same side of the computer that you position the drive, otherwise the data cable is just too short to reach the interface's connector.

TECHNICAL SPECIFICATIONS

Cumana's 300 Series uses a high speed, multi-session PhotoCD compatible Panasonic drive. It can operate in single or double speed modes, with a transfer rate of 300Kb/s, a 64K buffer and a fast access time of 320ms. With these excellent specifications, it is quite capable of playing *Replay* films at 25fps, if you have an ARM3 based computer. Otherwise you're limited to a perfectly adequate 12.5fps. I was initially quite puzzled as to how to get the drive to go into the

Morley's "Revolution" CD-ROM

single speed, 150Kb/s mode. Although the version of the Compact Disc Filing System (CDFS) supplied on the interface card had the command **CDSpeed*, it didn't actually seem to do anything. After chatting to Cumana's technical people, it transpired that I'd been sent an early version of the CDFS, in which the command hadn't been fully implemented yet. Cumana promptly sent me the latest version of the CDFS, v2.2, which supports the command correctly. I'm not sure why anyone would want to use the drive in single speed mode, though. Even at 300Kb/s, a CD-ROM drive is very slow compared to modern hard drives that can transfer data at well over 1Mb/s.

Based on a Sony drive, and also multi-session PhotoCD compatible, Morley's Revolution, on the other hand, only operates in the single speed mode of 150Kb/s, with a considerably slower access time of 490ms. Now it's not only Replay films which benefit from a 300Kb/s transfer rate. Just try loading a 2Mb sprite, or searching for a specific file on a disc that contains up to 640Mb of files, and you certainly appreciate the extra speed.

A second physical difference between the two drives is the way in which their disc trays operate. While the Revolution's disc tray is spring-loaded (you have to physically push the tray into the drive), Cumana's disc tray is motorised. Simply press the eject button a second time, or apply a little pressure to the front of the tray, and it automatically slides home. Cumana certainly wins the prize for its hardware.

INSTALLATION

Installing the systems is very simple: insert the expansion card, connect the drive, and turn everything on. Both Morley and Cumana cater for the different types of Acorn computers. Morley supplies an 8-bit minipodule for the A3000 and A4000 series computers, and a single width, 16-bit card for everyone else. Cumana does the same, but also offers a SLCD card for users of its *Expandable Multi Use* (EMU) interface, meaning that you could connect their CD-ROM drive, an IDE hard drive and a Concept Keyboard, etc., to an A3000 or A4000 series computer - a very attractive option for schools.

IN USE

Both the Revolution and the 300 Series use functionally identical versions of the CDFS software, the main difference being that the software has been modified to support the Sony and Panasonic drives respectively. The CDFS software is held in ROM on both expansion cards, so there's no need to install any extra software off floppy disc.

When you turn your computer on, a CDFS icon automatically appears on the very left of the icon bar. Unlike SCSI and IDE, there is no need to enter any configuration commands, although a menu option available from the CDFS icon allows you to configure the system for more than one drive. You can also alter the size of the CDFS buffer, used for storing directory information.

Both drives can read Archimedes and PC format CDs, and detailed instructions are supplied in the manuals on setting up the PC Emulator to use the PC format discs. You can also read PC discs under RISC OS, although this is only really useful for graphics and text files. As most images on CD-ROM are stored in TIFF or PCX format, Morley and Cumana supply Acorn's image processing and conversion software, *ChangeFSI*, on their utility floppy discs. This is the same version of ChangeFSI supplied with RISC OS 3. However, although these drives are PhotoCD compatible, this version of ChangeFSI is not, so you won't be able to examine PhotoCD images with it. Acorn is working on new PhotoCD software (see last month's article on PhotoCD), which might just be available by the time you read this.

An identical application supplied on both utility discs is the very useful *CDPlayer*. This little program emulates the control panel, or remote control, of an audio CD player. Simply insert your favourite CD, click on the Play button or enter the track number, and you can relax while you work to Bach, the Beatles, Madonna, etc.

PROBLEMS

Having used the Revolution and the 300 Series for well over a month now, with a wide variety of CD-ROMs from different sources, I have found only one minor problem. It's got nothing to do with either drive, but is caused by a very obscure bug in the CDFS. Rarely, and for no apparent reason, the entire computer will hang when a Replay audio file has finished playing, and the only solution is to reset the computer. (This bug seems to have been fixed in CDFS v2.2, as it hasn't re-occurred in the short time I've been using it.)

PRODUCT INFO

Product	*300 Series*
Supplier	*Cumana Limited* *Pines Trading Estate,* *Broad Street, Guildford,* *Surrey GU3 3BH.* *Tel. 0483 503121* *Fax 0483 451371*
Price	*£339.57 ex. VAT (with standard SLCD card)* *£305.45 ex. VAT (with SLCD upgrade card for EMU)* *£382.13 ex. VAT (with* EMU card and SLCD upgrade card)

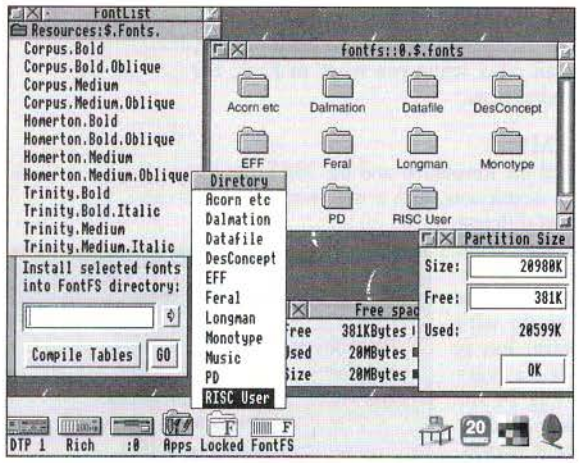
THE VERDICT

To sum it up very simply, Cumana has the better product. Even though its cable is too short, and the manual is less than satisfactory, the 300 Series uses a better and faster drive than Morley's Revolution. I feel that it's definitely worth the extra £40 which it costs.

Font Directory

A font control system reviewed by Richard Hallas.

If you have more than a handful of outline fonts on your hard disc, you will certainly know what a pain they can be to organise. The more fonts you add, the longer the computer takes to catalogue them, and eventually you need more than one font directory. Of course, there is the additional irritation caused by a handful of applications which refuse to work if you install more than a certain number of fonts.



Installing Fonts into the Font Filing system

Wouldn't it be useful if you could pick exactly which font families or faces you wanted to have available at any one time, and install or remove them individually as required? And how about being able to install just the fonts needed for a particular file? All these facilities and more are provided by Font Directory from LOOKsystems. This is a utility for hard disc users which keeps track of all your fonts, and lets you decide exactly which should be available to the system at any time. It replaces the normal method of storing fonts.

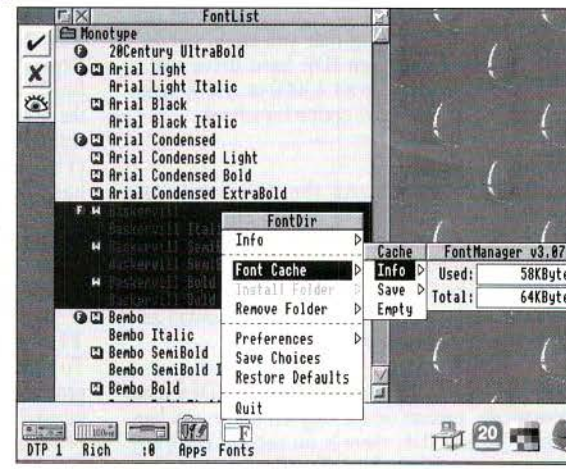
THE PACKAGE

Font Directory comes in an attractive white plastic wallet with one disc and a manual. The manual contains tutorial, reference and troubleshooting sections, and the disc contains two applications: Font Directory and Font Manager. Font Directory is the program you use all the time for controlling the availability of fonts. Font Manager is needed to physically install and remove font files on the disc.

MANAGING DIRECTORIES

Font Directory contains its own font filing system using a disc partition - very similar to the way RISC OS 3 treats a PC format 'hard disc' as a single file on an Archimedes hard drive. Rather than storing your fonts as separate directories on your hard disc, you place them in the font partition instead. The first thing to do, therefore, is create a partition. If you're short of hard disc space this can be a bit of a nuisance at first because you need to physically move your fonts across from the 'normal' *Fonts* folder into the new partition, and you may not initially have enough disc space to hold both the normally-stored fonts and a big enough partition to contain them all. Usefully, though, the partition can be resized at any time, so you could move the fonts across in several stages, increasing the size of the partition each time.

Font Manager lets you access the partition directly. Selecting an appropriate menu option opens a window containing a list all the fonts currently known to the system, and lets you select which ones to copy into the partition. Alternatively, you can simply open a directory viewer onto the font partition and copy the files manually. When you've finished, Font Manager must 'compile the tables', which is a necessary housekeeping task. This can take several seconds: on my system it took just under two minutes, but then I do have 20Mb of fonts. This has to be repeated each time the font partition is changed in any way.



Selecting Fonts with Font directory

Although the standard RISC OS limit of 77 files within each directory still applies, the font partition contains a set of top-level 'grouping' directories: it's like having up to 77 individually-named font folders at your command. You can call these directories whatever you want: you could have a directory for each type of font, font supplier, and so on. What it boils down to is that you can have up to 77 sets of 77 font families: a theoretical maximum of 5929! An added advantage of using the partition is that its directories use up only 2K of free space, whereas creating directories on some hard discs may use as much as 26K. You may therefore find that you can fit in more fonts than you could previously in the same disc space.

USING FONT DIRECTORY

Font Directory is used for everything except manipulating the partition. It installs an icon next to the Apps directory, and clicking on this opens a window listing all your fonts alphabetically by group. Each successive font family has an 'F' icon next to it, indicating a new Font; and within each font family, every new Weight has a 'W' icon next to it (see illustration). This really helps you to see how the font list breaks up. The weights are listed intelligently, with Regular coming first followed by all the other weights in ascending order of boldness.

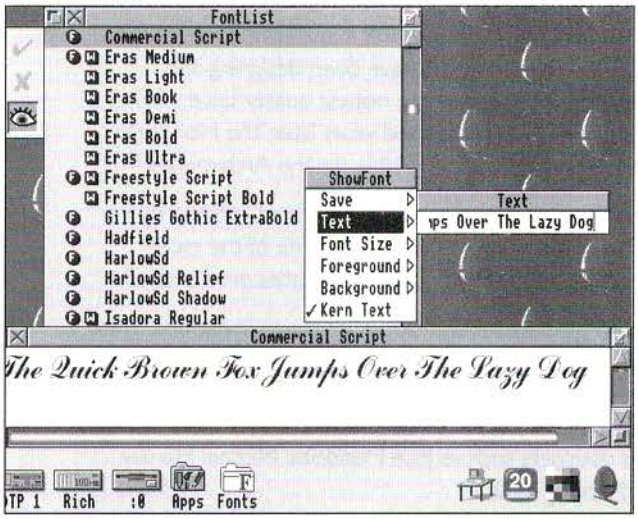
A small toolbox to the left of the window contains *tick*, *cross* and *eye* icons. These are used to make fonts available or unavailable to applications, and to examine them visually. You can select which fonts you want by clicking in the window: clicking on a name highlights that font individually, but you can also click on a 'W' or 'F' to select a whole weight or family at once, and you can also drag a box to select a whole group. One click on the *tick* or *cross*, and your selection is added to or removed from the available font list.

Clicking on the *eye* switches Font Directory into 'Show Font' mode, where clicking on a font displays a type sample in a window. You can change the colours and text used, and switch auto-kerning on or off for RISC OS 3 format fonts.

SCANNING

All this is extremely useful in itself, but Font Directory also has the ability to scan any file and determine which fonts it uses. Depending on what kind of drag you do (with or without Shift or Ctrl) the fonts in the file will either be added to the current range, replace the current range, or be highlighted in the font list window. (Fonts not on the system at all will be ignored.) It's hard to describe how useful this facility is, but once you have it you won't want to be without it!

You can make a default selection of the fonts you normally want available, and Font Directory will tell you have many families and faces you have: there's also an easy way to empty the font cache if it gets unwieldy.



Using Font directories "ShowFont" option

CRITICISMS

In order to make applications know that the fonts have changed, Font Directory has to redraw the screen. This looks a bit untidy, but there is currently no alternative. However, Font Directory can notify applications directly when the fonts have changed, and if other programs support this feature, operation should become much smoother. I very much hope that other software houses will take the trouble to make their applications interact with Font Directory, as it is so useful it deserves to be supported.

PRODUCT INFO

Product	*Font Directory*
Supplier	*LOOKsystems* *47 Goodhale Road,* *Bowthorpe,* *Norwich NR5 9AY.* *Tel. 0603 748253* *Fax 0603 764011*
Price	*£35 inc. VAT and p&p*

CONCLUSIONS

This program pro-vides the kind of facilities which should have been built into the operating system in the first place. It is very easy to use, and I find it utterly invaluable. Anyone who has more than a handful of fonts should buy it without delay. It is superbly presented, operates flawlessly, and has become a permanent addition to my icon-bar.

World-class Typography

Monotype craftspeople have been designing and supplying typefaces of the highest quality since 1897. Today, nearly one hundred years later, the Monotype Classic Font library is available for the Archimedes.™

The library includes over 600 typefaces, created by master type designers, boasting some of the most beautiful, useful and enduring typefaces ever created.

These typefaces aren't clones or cheap imitations. They are razor sharp adaptations of the world-renown hot metal faces created by Monotype over the past century. This includes contemporary faces commissioned from top designers such as Jose Mendoza, Michael Harvey and Chong Wah.

In terms of tradition and innovation, Monotype typefaces are second to none.

RISC OS Outline Fonts

Using specially designed hinting tools, LOOKsystems have carefully converted the Monotype Classic Fonts* for use on all Acorn™ RISC OS computers.

Each font is created from the original Monotype outlines and intmetrics data and is completely compatible with its PostScript™ equivalent.

The fonts include scaffolding, kerning pairs and, where appropriate, skeleton lines are added to ensure that characters with thin lines are correctly displayed at low resolutions.

Before being released, each font is checked at 300 dpi, in a variety of sizes (usually 4pt, 6pt and 8pt), to make sure that every character is properly rendered.

Fonts can be installed in either RISC OS 2 or RISC OS 3 format with kerning pairs.

Historic Prices

What's more, these typefaces are cheaper than ever before! At less than £1 per font, you can afford to buy the very best in typeface design and rest assured in the knowledge that you own the originals.

Further details, education discounts and site licence prices are available on request.

LOOKsystems
47 Goodhale Road
Bowthorpe
Norwich
NR5 9AY.

Telephone: (0603) 764114.
Facsimile: (0603) 764011.

The names of companies and products as they are mentioned are the trademarks and/or tradenames of their respective owners.

* Typefaces licensed by the Monotype Corporation.

Just a Page

This month we present two more short and interesting Basic programs for you to type and run.

CHAOS

David Brinnen

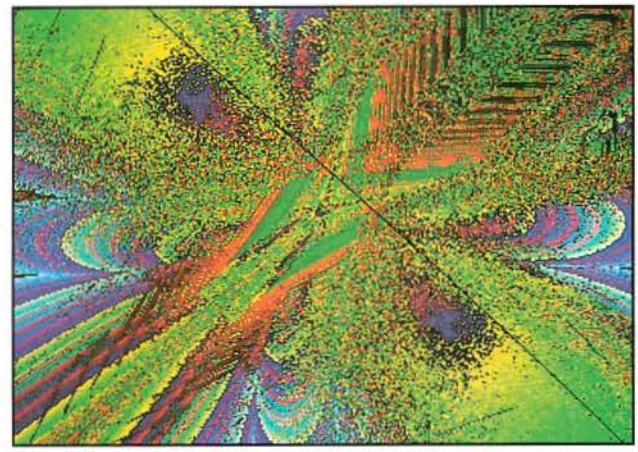
David Brinnen is not sure what this program does, nor indeed how it works. David created it by trial and error playing around with mathematical equations. All he does know is that it produces a curious degree of order out of apparent chaos not entirely dissimilar to that produced by the Mandelbrot Set.

To try it for yourself, use Edit to create a new Basic file and type in listing 1. Save this with the name *Chaos* for example. To run the program simply double-click on its icon.

The REPEAT-UNTIL loop from line 190 to line 240 is iterative in nature. The colour displayed at each point is related to the number of iterations before the terminating condition is satisfied. It is also worth trying variations of the formulae given, or varying the preset values.

With all its number crunching the program does take some time to fill the screen, so choose some slack moments to run it. David is aware that the program would be better written in machine code. If anyone feels it worth the trouble we will put such a version on a future magazine disc. Likewise any explanation of the results produced by the program would be welcome.

```
   10 REM Program   Chaos
   20 REM Version   A1.0
   30 REM Author    David Brinnen
   40 REM RISC User Jan/Feb 1994
   50 REM Program   Subject to Copyright
   60 REM           Not Public Domain
   70 :
  100 MODE 13
  110 OFF
  120 ORIGIN 640,512
  130 S=100:REM S=Scale factor
  140 FOR Y=-512 TO 512 STEP 4
  150 Y1=Y/S
  160 FOR X=-640 TO 640 STEP 4
  170 X1=X/S
  180 X2=1:Y2=1:I%=0
  190 REPEAT
  200 I%+=1:T=S/I%
  210 XI=(SQR(ABS(Y1-Y2))-SQR(ABS(X1+X2-
Y2)))*T
  220 Y2=(SQR(ABS(X1-X2))-SQR(ABS(Y1+Y2-
X2)))*T
  230 X2=XI
  240 UNTIL SQR(X2*X2+Y2*Y2)<1
  250 GCOL 0,I%DIV4 TINT I%MOD4*63
  260 POINT X,Y
  270 NEXT:NEXT
  280 END
```



Result of running Chaos program

DESKTOP PASSWORD UTILITY

Jimmy Imossi

This short utility can be used to prevent your computer from being used by others. When activated it disables the Escape key and will not allow access to your system until an appropriate password has been entered.

1. Create an application within your root directory and call it *!Lock* (or *!Protect* or any other name you want). Open the application directory by holding down Shift and double-clicking on the icon.
2. Type in the listing below and save it as !RunImage within the application directory.
3. Use Edit to create an Obey file and type in the following lines:

   ```
   Set Password$Dir <Obey$Dir>
   Run <Obey$Dir>.!RunImage
   ```

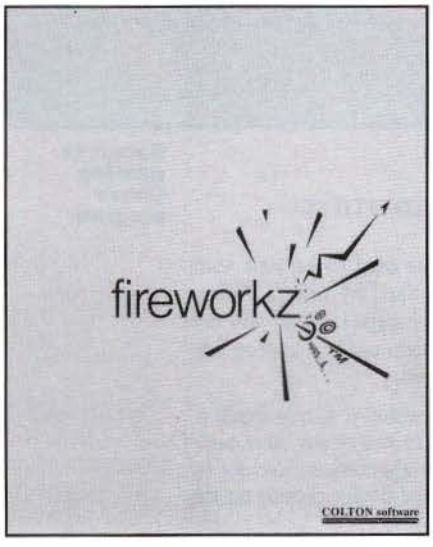
   Save this as !Boot, and again as !Run, both within the application directory.
4. Finally use Edit to create an ordinary text file and type in the password you wish to use (no need to press Return). Save this as the file *Password* within the directory. Note that the password must be no longer than 200 characters!

Continued on page 38

Fireworkz

Mike Williams assesses the benefits of integration now available to users of Colton Software's Wordz and Resultz.

First we had *Wordz*, then came *Resultz*, and now Colton has integrated the two: *Fireworkz*! The purpose of this review is to assess Fireworkz as the first step towards a fully integrated software suite comprising word processor, spreadsheet and database. To date we have the word processor (Wordz, reviewed in RISC User 6:6) and the spreadsheet (Resultz, reviewed in RISC User 7:1). The database, *Recordz*, is scheduled for the middle of this year.



While the notion of integrated software has found much favour in the PC and Mac worlds (e.g. *Claris Works*) there has been little to date for the Archimedes platform. Acorn itself released *Advance* early last year (reviewed in RISC User 6:6 and 6:7). However, this is more a suite of separate applications with a common front-end so that they appear as a single entity to the user. To a large extent integration is achieved by default. The separate software components of Advance pass data from one to the other in much as any multi-tasking applications within the RISC OS Desktop environment.

If several applications can multi-task concurrently, exchanging data as and when required, is there any real need for a more integrated approach? Colton clearly believes so, and its integrated but modular approach might well be a model for others to follow.

Right, let's concentrate on Fireworkz, see what it is and how it works, and judge whether Colton's integrated approach has paid off for the user. If you buy the full pack, then in the box you will receive two discs (a program disc and an examples disc), a copy of the Wordz User Guide, the Resultz User Guide and Function Reference Guide, and the Fireworkz User Guide. Various upgrade options are available for existing Wordz and Resultz users, the principal items being the Fireworkz program and examples discs and the new and separate Fireworkz manual. The latter is a slim manual of just under 100 pages. Its main purpose is to introduce the use of Fireworkz for documents and spreadsheets to the new user, and update existing Wordz and Resultz users with any new features and how existing features have been combined. Very usefully it also contains a very comprehensive index which cross-references all four of the manuals that make up the Fireworkz package.

SOME KEY FEATURES OF FIREWORKZ

Once installed on the icon bar, Fireworkz allows you to create either a new spreadsheet, or a new document. The resulting screen display is much the same, but a spreadsheet shows the usual rows and columns, while the document layout shows a blank sheet of paper. Otherwise the window layout is the same, with the same dual button bars covering both word processing and spreadsheet functions (see figure 1).

The style editor in Fireworkz combines the features of the individual style editors in Wordz and Resultz. The same extended style characteristics can now be applied equally to cells and to text. Indeed, as far as Fireworkz is concerned there isn't really much difference between the two, as all aspects controlled by the style editor apply to both. As far as the user is concerned, text is entered directly onto the page, while numbers and formulae are entered indirectly via the formula line at the head of the document window.

In fact, all Fireworkz documents have an underlying grid, more obvious in spreadsheets, but still there in text documents where each paragraph, however short or long, exists as a full-width text cell. A *Faint grid* option allows this to be visible if required.

A related feature of Fireworkz (and of Wordz and Resultz) is that of *Regions*. Styles and Effects can be applied to any selected area of a sheet or document, this area being known as a region.

This can result in areas with quite complex sequences of overlapping regions, and the more complex these become the more sluggish will Fireworkz be as it processes this information when refreshing the display. Regions can be edited to reveal the different styles and effects in use, and to remove and simplify an otherwise unduly complex structure.

Both Wordz and Resultz files can be loaded into Fireworkz (they all use a common format). However, such files then become full Fireworkz files, with access to all the facilities of Fireworkz. In reverse, a Fireworkz spreadsheet can be loaded into Resultz, and a Fireworkz document can be loaded into Wordz, but Wordz doesn't understand formulae, and Resultz doesn't know about spelling. Fireworkz also supports the so-called *Rich Text Format* (RTF) used by many word processors including Microsoft *Word*. This ensures much of the existing formatting information is retained when the file is loaded into Fireworkz, or Fireworkz files exported in RTF format.

One of the keys to the level of integration achieved by Fireworkz is through the use of *names*. Names can be defined as variables holding number or text data, or as pointers to cells. They can be used to establish live references in text to values in a table, and to provide links between documents and sheets. Graphs and charts created with Fireworkz can have live links with data stored elsewhere. At any time, Fireworkz maintains a table of all names associated with all documents currently open. All documents (or sheets) can then reference any and all of these name references.

ASSESSING THE BENEFITS

Multi-tasking applications running within the RISC OS Desktop benefit from the facility to exchange data directly one with the other. Data from a spreadsheet can be exported into a graph package or into a DTP application. But there are disadvantages to this approach as well.

Because applications are written independently by different software houses, data has to adopt a minimal common standard, and unless software houses co-operate, live links are impossible (unless again a common standard for such a facility is agreed and used by all). Thus data in a spreadsheet imported into a DTP package is no longer updated when the original data is changed. Furthermore, many applications will duplicate the same basic functions leading to higher memory requirements overall than might be the case for an integrated package. For example, when first loaded, Wordz grabs 704K of memory, Resultz grabs 864K, but Fireworkz (which combines both) takes just 896K, though Fireworkz does seem very poor at relinquishing memory grabbed for a large file when a smaller one is subsequently loaded.

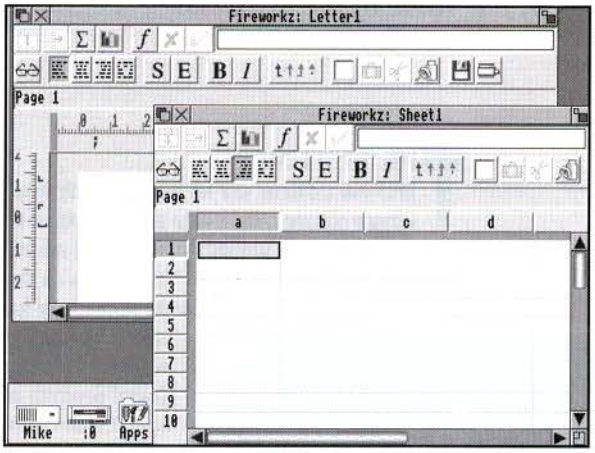


Figure 1. Initial sheet and document windows showing common layout

Thus an application such as Fireworkz, particularly if constructed on a modular basis, has potentially much to offer compared with other alternatives. And in my relatively limited use of Fireworkz it does seem to be exceedingly good at combining text and spreadsheet functions in a single highly integrated window display.

But are there any disadvantages? Well, you have to judge for yourself how well Fireworkz competes as a spreadsheet or as a word processor with other such packages. But Colton has given users a choice. If you don't want all that Fireworkz has to offer, then both Wordz and Resultz are excellent packages in their own right. And if you like the integrated approach, and the benefits of live links and intermeshed spreadsheets and WP, then Fireworkz has to be the best there is for the Archimedes. It could even be the best there is for the PC too, as Colton has announced a PC version of Fireworkz to be launched at BETT. An integrated software package which will run on PC and Arc platforms with a common file standard - now that really is something to take note of.

PRODUCT INFO

Product	*Fireworkz*
Supplier	*Colton Software,* *2 Signet Court,* *Swanns Road,* *Cambridge CB5 8LA.* *Tel. 0223 311881*
Price	*£149 ex. VAT*

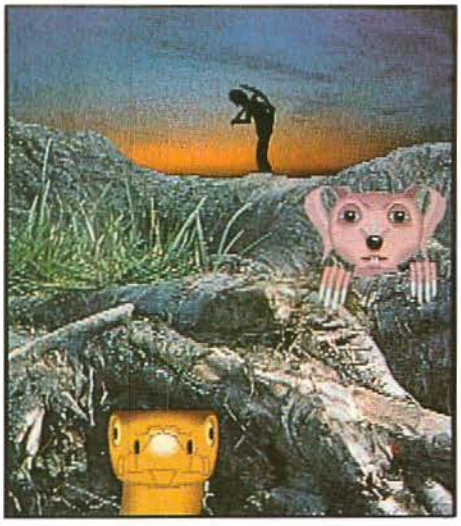
Upgrade from Resultz £50 ex. VAT
Upgrade from Wordz £70 ex. VAT
Upgrade from other packages (e.g. Pipedream, Eureka, etc.) £99 ex. VAT.

What's Cooking at 4Mation?

Mike Matson, one of the names behind 4Mation, has some of the answers.

THE '93 SLUMP

1993 was a difficult year for many (probably most) software publishers, and it came as quite a surprise to most of us that so many survived the year. While I still feel obliged to give digital salutes to Tesco trucks on the motorway, I remain unconvinced that the Tesco scheme for schools was the sole reason for the general downturn in sales. Certainly, by the time of the Acorn World Show in October, there was a hint of optimism in the air.



Advance screens from 4Mation's Photo Interaction

From the software purchaser's point of view, the '93 slump had the effect of keeping prices down and, in real terms, software has never before been so reasonably priced. I deliberately use the term *software purchaser* because we all know that the software *user* is not necessarily a *purchaser*. Some of our titles are released on protected discs; others are not. It is significant that the ratio of sales of protected titles to unprotected titles is about 10:1. Whenever someone suggests that piracy is no longer a problem I like to remind them about the case of the 14 schools which, between them, had acquired enough illegal software to save themselves £127,000.

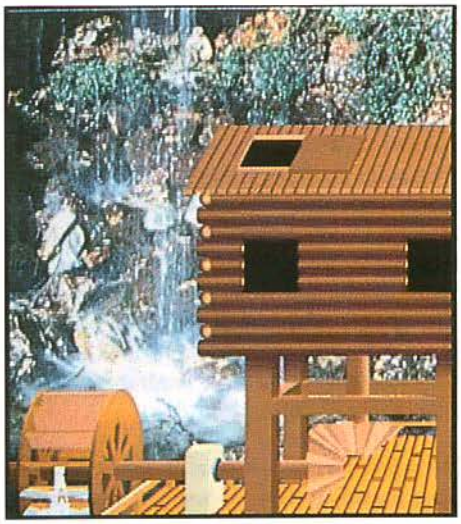
IT TAKES ALL SORTS

Being in the software publishing business certainly opens your eyes and provides an endless repertoire of stories to be swapped over the occasional after-show pint. Yes, Acorn software publishers do talk to each other, as many a punter has found to his cost after trying to play one off against another. At the last Acorn World Show someone actually said to a publisher, "I can't afford that program. Couldn't you just copy it onto this disc for me?" We have teachers telling us that we're only in it for the money and ought to give the software away (presumably in the same way that they always hand back their pay cheque), while magazines can come up with some wonderful schemes. One particularly hare-brained suggestion was that we should give away a free program to the first 50 readers who wrote in and asked for it. They never did explain how hiring staff to open 40,000 letters, let alone giving away software, would endear us to our bank manager. And we even manage to stay polite when a reviewer rings up at 10am (or even 10pm!) on a Sunday asking for some information about a product!

"Look out for PhotoInteraction. If Roger Rabbit can do it, so can we!"

4MATION OVERSEAS

One of the fringe benefits of software publishing is the opportunity to establish relationships with people from other countries. An overseas contact might be someone from South Africa writing to say that *Vector* satisfies all his requirements in a drawing program for professional desktop publishing, someone from the Netherlands providing a Dutch translation, an Australian company discussing reciprocal publishing arrangements, or a New Zealander writing a program for us to publish. During the last few months we have come to rely increasingly upon electronic mail (using Internet) to provide efficient communications and to transmit code. A utility written by one of our Kiwi colleagues has proved to be an enormous asset in sending code across the world. *Update* is an application which examines the differences between the previous version of a program (or directory) and a new version, and then creates a compressed text file of the changes. The text file is sent via modem and, at the



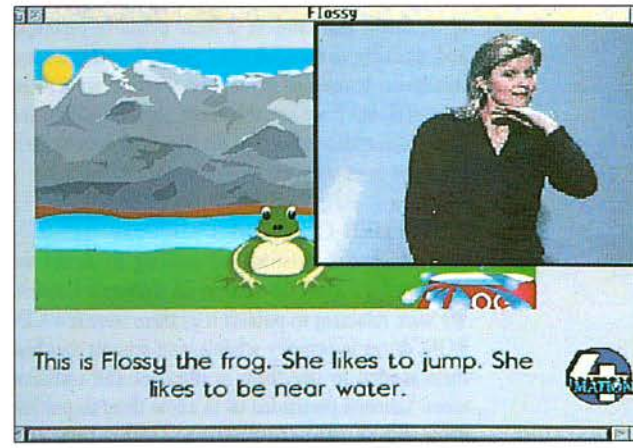
receiving end, is used by *Update* to convert the old version into the new version. The savings in online time and expense can be quite enormous. *Update* is currently being evaluated by three other publishers who have programmers overseas (Clares, Sherston and ExpLAN).

GERMANY

We welcomed Acorn's venture into the German market and were very pleased to receive a request from Matthias Schneider and Stefan Scholz to allow them to translate and publish German versions of *Vector*, *Chameleon* and *Hatchback*. We have established a good working relationship with them and were delighted to discover that there is a possibility that they are even more eccentric than we are.

AUSTRALIAN MATHS

By the time you read this we should have published *Maths Circus*, a program aimed at younger users and produced by our Australian friends, Greygum. Yes, I know it sounds the sort of thing we would normally avoid like the plague but, apart from the title, it is an excellent product. In fact I can't think of any other program which has succeeded in making me sit at my machine until I have completed all the puzzles. Although intended for the primary age range, some of the hardest mathematical puzzles would defeat the majority of adults.



Flossy the Frog with sign language

SPECIAL NEEDS

It has always been our view that, wherever possible, children with special needs should have access to mainstream software rather than having software developed specially for them. When the mainstream software market itself isn't particularly large it is rarely commercially viable for high quality programs to be written for a very small numbers of users.

One of the most exciting projects in which we have been involved is the creation of a sign language CD-ROM version of *Explore with Flossy the Frog*. We hope to have two versions on the CD: Australian Sign Language and British Sign Language. Whenever one of the 300 sentences is displayed on the screen, a corresponding sign language Replay film is shown. Adapting Flossy to show Replay files was an amazingly straightforward task (well done Acorn!). The project was initiated by Dr Jan Branson of the School of Education at La Trobe University in Victoria, Australia. A great deal of support and assistance has been provided by Acorn Australia and Acorn UK. As far as we are aware this project is a world first and we are very proud to have been associated with it.

When we began the sign language project we realised that we were quite ignorant about sign language and how it is used. Likewise, we knew very little about the

various symbol languages which are used in special needs. For a variety of reasons there are some individuals who find it easier to communicate with symbols than written (or spoken) languages. We have versioned some of our programs in other written languages. *Granny's Garden*, for example, is available in French, German, Italian, Welsh, Swedish and Icelandic. We realised that it would be just as easy for us to produce versions which use Bliss, Compic or Rebus symbols if those symbols were available in a font format. We have, therefore, been trying to persuade various bodies and organisations to get together to agree, firstly, that symbols in fonts would be beneficial and, secondly, to establish some common guidelines and standards. It remains to be seen whether we will be successful, but if we are, the Acorn platform will be the first which makes it easy for developers to version their programs to use symbols.

ANOTHER CD-ROM

After much arm twisting and cajoling by Acorn we developed a CD-ROM version of *Granny's Garden*. We were reluctant to publish it as there were few CD-ROM drives in primary schools, and schools that had them tended to site them in libraries and resource areas. Cumana persuaded us to allow them to publish it (or did we persuade them?) and it has been very encouraging to hear that some primary schools have purchased CD-ROM drives after having seen Granny in action. We made use of the additional storage space on the CD to include music and sound effects, a Replay audio of yours truly reading a story, and an additional high resolution version of the program (mode 21/28) for the benefit of those with VGA or multiscan monitors. *Granny* was created using our very own authoring system which allows us to produce versions in different resolutions automatically. If, as we hope, there is sufficient demand for CD-ROM products in primary schools, we will certainly be enthusiastic about producing more.

INFORMATION

Anyone wishing to contact Mike Matson about Update, the 4Mation authoring system or any other matters can write to him at:

Little Dormy, Five Ash Down,
Uckfield, East Sussex TN22 3AP.
Tel/Fax 0825 732679 (not 10pm Sundays!)
email: mmatson@cix.compulink.co.uk

THE 4MATION AUTHORING SYSTEM

In 1992 we published *Noot*, an application which allows Draw files to be animated very easily. Since then, Dave Caughley has improved upon the animation techniques and added a vast range of facilities so that we now have an extremely flexible and very powerful system which allows us to create programs efficiently, quickly and easily. I don't want to give away too many secrets, but two of the outstanding features are the automatic anti-aliasing and the touch-sensitive areas. All graphics and animations are created as Draw files which are then converted into anti-aliased sprites. The advantage of this method of creating sprites is that editing is easy. If, for example, we wish to enlarge an animated lizard, we just scale up the original drawings and drop them back into the editor. Within seconds the edited sprites are incorporated into the program. Those who have tried editing sprites will appreciate the beauty of this system. Touch-sensitive areas (hot spots) are zones which cause some action to occur when they are clicked upon. In most programs these areas are rectangular. In our system the areas can be any shape. Those who have used *Chameleon* or *Hatchback* will already be familiar with this feature.

Initially we restricted the use of the authoring system to ourselves. Artists provided us with the graphics and we used the system to create the programs. Understandably, they often objected to the way in which we carved up their creations to suit our requirements. We decided to make the system available to the artists themselves so that any hacking would be done by them alone. The result is that they, with a minimum of programming experience, are able to create their own programs. Those who had tried creating *Genesis* applications were particularly pleased with the extra power and flexibility that our system offered. It has been very gratifying for us to know that most of the artists choose to use *Vector* and *Chameleon* in the creation of their graphics.

Although we have no intention of making our authoring system generally available, we have been approached by some by other developers who are interested in making use of it to create products quite different from our own. While we are concentrating on using the system to create programs for children, they are interested in producing programs for the adult market.

SHHHH!

For many months we have been working on the Acorn version of some control software. I can't mention the name of the product or the company for whom we have been working, but I think I can get away with saying that the company concerned is international and as solid as a brick.

AND FINALLY

Look out for *PhotoInteraction*. If Roger Rabbit can do it, so can we!

TWAIN

Linking Applications and Images

TWAIN is an image acquisition standard for easy communication between image capturing devices and software applications, developed by a coalition of companies including Kodak, HP, Aldus, Caere and Logitech. Implemented on the PC and Mac, and now for RISC OS. In brief TWAIN does for scanners what RISC OS printer drivers do for printers.

- Applications supporting TWAIN can use any device with a TWAIN driver.
- Adding TWAIN to applications is easy.
- Freely distributable, TWAIN manager, C glue library and Demo driver. Completely open standard - anyone can write TWAIN drivers.
- TWAIN makes scanner support easy, and opens the way to using cheap industry standard hardware with all RISC OS software that uses sprites.

TWAIN for the HP ScanJet (SCSI) £20.00 (inc. VAT and carriage).
(TWAIN for the Canon (Scanlight Pro) and Epson ranges available soon)

IMAGE MASTER

A new image processing program, allowing format conversion, and image acquisition from scanners via TWAIN.

- Reads and Writes, TIFF, JPEG, PCX, PBM, Clear, Sprite, BMP, GIF, MTV.
- Handles images bigger than RAM - "virtual memory".
- TWAIN compliant.
- Works with 1,2,4,8,16,24 and 32 bit per pixel images. Future ready.
- Processing, resample/rescale, user defined filters, colour balance, non-linear contrast adjustment. Supports RGB, HSV and CMYK colour models.
- Editing, Rotate, Crop, Shear, Flip images.
- Change colour resolution, with Floyd Steinberg and ordered dithering. Optimised palettes.
- Supplied with Trace (convert sprites to Draw files), D2Font (convert Draw files to fonts). Snapper (screen capture program).
- Mode independent, page oriented program. Multiple views/files.

ImageMaster £30.00 (inc VAT and carriage)

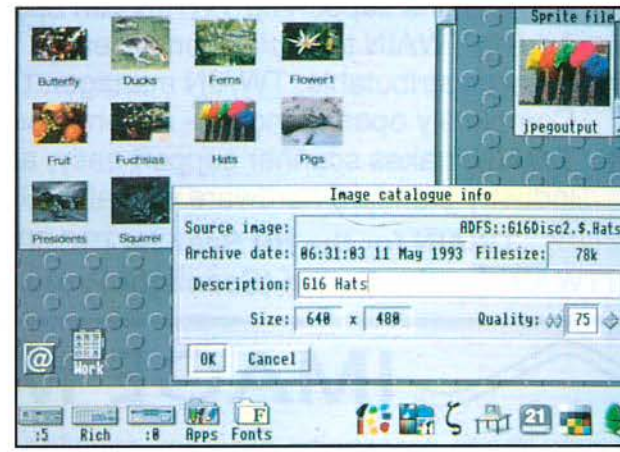
Introductory offer, one TWAIN driver plus ImageMaster
£35.00 (inc VAT and carriage)
TWAIN compliant version of ArcFax due out now.

David Pilling, P.O. Box 22, Thornton Cleveleys, Blackpool. FY5 1LR. UK.
Free Air Mail delivery on overseas orders. Please send for free catalogue.

Image Bank

A compressed storage utility for images previewed by Richard Hallas

How would you like to be able to store 10Mb of images on a single 800K floppy disc? Irlam Instruments' new utility, *Image Bank*, lets you do just that. It is a utility for handling pictures obtained from a digitiser or scanner which are stored in a highly compressed format called JPEG. It presents a miniature thumbnail preview of each picture in a window, and lets you decompress the full-size versions in a variety of ways.



Editing image descriptions

The Image Bank 'FullInfo' and 'Decompression' windows

JPEG COMPRESSION

The JPEG (Joint Photographic Experts Group) compression technique is 'lossy': the quality of the decompressed image is not as good as the uncompressed original. However, the amazing compression rate rather makes up for this: using JPEG can allow you to compress images down to around 5% of their original size. What's more, you can choose the quality of the compressed image, so you can determine the trade-off between storage space and image quality yourself. In fact, it is usually very difficult to discern any loss in quality when looking at a decompressed JPEG picture because of the way the human brain processes visual images.

IMAGE BANK

Image Bank provides a way of conveniently storing all your compressed pictures together with a small-size preview of each. Typically you would put an empty copy of Image Bank on each new disc, or directory, to be used for image storage. Subsequently dropping your JPEG images into the Image Bank window would cause it to store the file on the disc and create a preview in its window. In its current state, Image Bank doesn't actually do any JPEG compression itself, and since it will only accept JPEG images, you need a separate utility to create the JPEG files for you: ChangeFSI will do. However, a new version of the program which corrects these shortcomings is due shortly (see later).

IN USE

Clicking on the Image Bank icon opens a viewer which is like a cross between a Filer window and a sprite display in Paint. It shows a collection of postage-stamp images with their names underneath. They can be sorted by name, size or date, and instead of just the images and names

you can also list them with full info about size, memory used, and so on.

Dragging a JPEG file to the Image Bank window adds it to those already stored on disc and creates a small representation of it in the window. Double-clicking on any image opens up a window which lets you save the decompressed JPEG file in one of four formats: standard sprite, 256-level grey scale sprite, optimised sprite or Clear file (a 24-bit colour file format commonly used by image processing packages). An optimised sprite file doesn't look terribly good on screen, but may give better quality output on a colour printer: the palette uses the most common colours in the image to give the best possible 8-bit colour sprite.

Using Image Bank is an absolute doddle. It fully supports interactive help, but it's hardly necessary: operation is simple and obvious. All you have to do is copy Image Bank on to the required disc, choose the display format you like best, and drop JPEG files into the window. Image Bank does all the copying of files and creation of thumbnail pictures itself.

The main Image Bank window is attractively presented using the Homerton font. If you prefer to use the system font instead, or would like to alter the size of the thumbnail pictures, you can do this by editing a *Choices* file. This is a bit unfriendly, but most people won't want to bother, as the defaults are sensible in any case. The window title bar tells you how many images you have in the bank, how much actual disc space they use, and their total size when decompressed.

NEW VERSION

Image Bank is currently supplied on a single floppy disc without any packaging or printed documentation, as it was intended primarily for demonstrating Irlam's scanners. However, it has attracted quite a lot of interest, and a new version is due for launch at the BETT show. The new version will be packaged up properly, as you would expect of a commercial product, and will have a number of significant enhancements.

The biggest limitation of the current version is that it will only store JPEG files, although it will export them in various sprite formats, or as Clear files. The new version will also accept other file formats, in particular sprites and Clear files, and it will convert them into JPEG files for you automatically. The direct sprite import will also accept the various new 'flavours' of full-colour sprite, up to 32-bit in depth.

Another highly useful feature of the new version is that it will let you organise your images into subject directories, so it will be possible to have various 'pages' of images, filed under subject, rather than just the single set currently available. It will also be able to display the images at full size in its own windows, rather than requiring you to export them first.

CONCLUSIONS

For anyone who wants to store a large number of images in a small space and in a very easily accessible form, Image Bank is ideal. It strikes me that this is the absolutely perfect program for supplying with CD-ROMs full of images (the Image Warehouse kind of disc: see review in RISC User 6:8, p 32). All the pictures can be seen in miniature without having to fiddle about with black and white booklets or, worse, having to use ChangeFSI to look at each image; also, of course, the new version of Image Bank will allow the pictures to be categorised.

This little program is currently quite good value for £15. However, by the time you read this the new version should be either imminent or already released and, considering that the price will be only marginally higher, should represent exceptional value. The number of extra facilities in the new version, and in particular its ability to create JPEG files automatically, should make it invaluable to anyone who deals with large numbers of bit map images.

PRODUCT INFO

Product	*Image Bank*
Supplier	*Irlam Instruments Ltd, Brunel Institute for Bioengineering, Brunel University, Uxbridge, Middlesex UB8 3PH. Tel./Fax 0895 811401*
Price	*£15 ex. VAT New version approx. £19.95 ex.VAT*

(Image Bank requires RISC OS 3.1 to operate.)

Turn Up the Heat on your Keyboard

If the HotKeys application on last month's magazine disc whetted your appetite to find out how it's all done, author Peter Burwood reveals all (nearly).

RISC OS makes it very easy to open dozens of windows on the Desktop. Unfortunately, managing them can be a real nightmare. Have you ever cursed when you can see the window you want, such as a Filer or editor window, but its title bar and resize and bring-to-front icons are totally obscured by other windows. Well here is a simple solution to give your mouse buttons a rest ,and clear the blue air around your monitor. The *HotKeys* utility listed here is a cut down version of the application supplied on last month's disc, and provides keyboard shortcuts for manipulating the window stack and executing almost any other function possible with a star command.

Alt-Up (U) :	pop window
Alt-Down (D) :	push window
Alt-Left (L) :	pop one
Alt-Right (R) :	push one
Alt-B :	push behind
Alt-F :	pop to front
Alt-F4 : / Alt-Select : / Alt-Adjust :	close window
Alt-Shift-U/D/L/R :	move window
Alt-Shift-2 :	open csd
Alt-Shift-4 :	open $
Alt-Shift-5 :	open lib
Alt-Esc :	kill HotKeys

Figure 1. The various hotkey combinations

HotKeys works with both RISC OS 2 and RISC OS 3, although certain functions can only be used with RISC OS 3.

CREATING THE APPLICATION

First of all, create an application directory called *!HotKeys*, and save inside it a sprite file called *!Sprites* which contains a 34x17 pixel mode 12 sprite of your own design called *!hotkeys*. Next, use your text editor (e.g. *Edit* or *DeskEdit*) to create an Obey file containing the following lines:

```
WimpSlot -min 32k -max 32k
IF "<HotKeys$Dir>"<>"" Then Error
HotKeys is already running
Set HotKeys$Dir <Obey$Dir>
Run <Obey$Dir>.!RunImage
Unset HotKeys$Dir
```

This should be saved as *!Run* inside the *!HotKeys* directory. Finally you should type in Listing 1 and save it as *!RunImage* in the same directory.

USING HotKeys

Run *HotKeys* by double-clicking on its icon in a Filer window. *HotKeys* does not place an icon on the icon bar since it is a utility rather than an application. You should be able to have *HotKeys* running all the time as it only requires a maximum of 32Kb. If you would like it to run automatically when you turn your computer on, simply add the following line to your Desktop boot file for RISC OS 3:

```
Filer_Run ADFS::4.$.!HotKeys
```

or:

```
Run ADFS::4.$.!HotKeys
```

for RISC OS 2. Remember to modify the pathname *ADFS::4.$* to reflect where *HotKeys* is located on your own computer. Figure 1 shows the functions provided by *HotKeys*, and the keyboard shortcuts for activating them. And that's all there is to it!

PROGRAM NOTES

The first part of the program, up to line 620, consists of the normal Wimp initialisation and poll loop and is not described further here. Writing Wimp applications is covered in considerable detail in the *Mastering the Wimp* series (RISC User 2:9 to 4:6), and in the book *Wimp Programming for All.*

The following explanation is straightforward, but it is not essential to extending and customising the program as described later.

HotKeys works by grabbing unclaimed keypresses, via reason code 8, and calling the procedure *PROChotkey* to perform the necessary action (line 310). Because of the way current versions of RISC OS handle the Alt key, a separate routine is needed to scan the keyboard to detect if the Alt key is held down. *PROCscan_keys* is called via the 'null' reason code (line 280), and uses the *OS_Byte* SWI with R0=121 and R1 equal to 2, the internal key number for the Alt key (see figure 2), EORed with &80. For a full explanation of this, you will need

to refer to the Programmer's Reference Manual. *PROCscan_keys* then generates a hotkey code for the various Alt combinations (see figure 3) and this is added to the internal key number for the key pressed with Alt, and passed to *PROChotkey* for processing. For example, if you were to hold down the Alt and Shift keys, and then press 'U', *PROCscan_keys* would pass a value of &A00+&35=&A35 to *PROChotkey*. Figure 2 shows the internal key numbers for all the keys on the keyboard. You could thus add an extra line to *PROChotkey* to detect Alt-U, e.g. WHEN &A35:PROCdo_something.

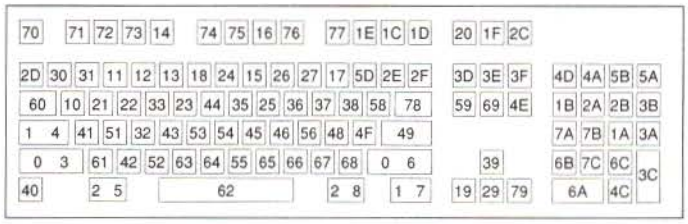


Figure 2.
The internal key numbers for the Archimedes keyboard

PROChotkey contains two major CASE statements, the first dealing with global functions and the second with window specific functions. Window specific functions affect the window under the mouse pointer. If the window has the input focus, i.e. its title bar is cream instead of grey, then you would normally not be able to use hotkeys with it. However, by using the *Ctrl* key in conjunction with the hotkey, the operation will work on this window as well.

If *HotKeys* does not recognise the hotkey combination, it passes it on to other applications as an unknown keystroke.

As keypresses are usually set to auto-repeat after a very short time, certain hotkey functions might end up being called several times before the hotkey is released, with rather undesirable effects. In order to avoid this, you should check whether the global variable *dblbounce%* is false before calling such a function, and then set *dblbounce%* to true when that function is entered. *PROCscan_keys* will only reset *dblbounce%* to false when the hotkey is released.

GLOBAL FUNCTIONS

HotKeys can be killed with Alt-Esc, and this is a useful alternative to using the Task window when testing your own functions.

PROCopendir handles the opening of the current and library directories. The root directory is opened via a star command to illustrate how a global function can execute any star command.

WINDOW SENSITIVE FUNCTIONS

PROCpush_window and *PROCpop_window* deal with pushing and popping the window one position in the window stack. Pushing a window to the bottom of the stack and popping a window to the top of the stack are performed inside *PROChotkey*.

There are three ways of closing a window: Alt-F4 and Alt-Select or Alt-Adjust, the latter two working as if the close icon had been clicked on by the respective mouse button. Alt-F4 works like Alt-Select on most windows, but works like Alt-Adjust on Filer windows.

PROCmove deals with moving a window around the screen in units of 32 OS pixels, and corresponds to dragging with Adjust on the title bar of the window.

EXTENDING HOTKEYS

Adding your own functions to *HotKeys* is very easy. Firstly, decide whether your function will require a full procedure or a single star command. If it will be in the form of a procedure, add the code to the end of the program, from line 2130 onwards, otherwise include the star command itself on the line immediately following the corresponding WHEN statement. Now choose the hotkey combination you want to use to activate the procedure or star command. The choice of hotkey should ideally be based upon the function it performs so it is easy to remember, e.g. Alt-B = push windows (B)ehind the Pinboard. If, for example, you decided to use Alt-0 to open the Filer window for drive zero, you would examine figure 2 to find the internal key number for the '0' key. This will be &27 if you use the '0' key in the row of numbers or &6A on the numeric keypad. Now examine figure 3 to find the code for the Alt key - &200. Simply add the two numbers together to get &227, and then add the following lines to *PROChotkey:*

Alt :	&200
Alt-Shift :	&A00
Alt-Ctrl :	&4200
Alt-Shift-Ctrl :	&4A00

Figure 3.
Hotkey codes for the Alt combinations

```
    901 WHEN &227
    902 *Filer_OpenDir ADFS::0.$
```

It really is as easy as that!

If you write any functions for HotKeys that you think would be of interest to other readers, send them in and we will consider publishing them in a future issue. Remember that we pay for all contributions that we use.

```
   10 REM            >!RunImage
   20 REM Program    !Hotkeys
   30 REM Version    A1.03
   40 REM Author     Peter J. Burwood
   50 REM RISC User January/February 1994
   60 REM Program    Subject to Copyright
   70 REM            Not Public Domain
   80 :
   90 DIM bl% &200, caret% 24
  100 maxw%=1024:DIM wstack%(maxw%)
  110 ON ERROR PROCerror:END
  120 :
  130 quit%=FALSE:ib%=-2:curwin%=-1
  140 hidden%=-1:dblbounce%=FALSE
  150 task$="HotKeys"
  160 SYS"Wimp_Initialise",200,&4B534154
,task$ TO version%,task%
  170 IF version%>=300 bl%!0=-2:SYS"Wimp
_GetWindowState",,bl%:ib%=!bl%
  180 whandle%=FNcreate
  190 PROCopen(whandle%,-2,FALSE)
  200 ON ERROR IF FNwimperror(bl%,ERL,RE
PORT$,task$,1,1)=2 THENPROCclose:END
  210 REPEAT:PROCpoll:UNTIL quit%
  220 PROCclose
  230 END
  240 :
  250 DEFPROCpoll
  260 LOCAL reason%
  270 SYS"Wimp_Poll",&3870,bl% TO reason
%
  280 CASE reason% OF
  290 WHEN 0 :PROCscan_keys
  300 WHEN 2 :IF !bl%=whandle% SYS"Wimp_
OpenWindow",,bl%
  310 WHEN 3 :quit%=TRUE
  320 WHEN 8 :PROChotkey(!bl%,bl%!24)
  330 WHEN 17,18 :quit% = bl%!16=0
  340 ENDCASE
  350 ENDPROC
  360 :
  370 DEFFNcreate
  380 LOCAL h%
  390 $bl%=STRING$(88,CHR$0)
  400 bl%!0 =-1056 : bl%!4 =0
  410 bl%!8 =-1024 : bl%!12=32
  420 bl%!16=0     : bl%!20=0
  430 bl%!24=-2    : bl%!28=&80001850
  440 bl%!40=0     : bl%!44=-32
  450 bl%!48=32    : bl%!52=0
  460 bl%!56=0     : bl%!60=0
  470 $(bl%+72)="HotKeyWin"
  480 SYS"Wimp_CreateWindow",,bl% TO h%
  490 =h%
  500 :
  510 DEFPROCclose
  520 PROCpop_windows
  530 SYS"Wimp_CloseDown",task%,&4B53415
4
  540 *Unset HotKeys$Dir
  550 ENDPROC
  560 :
  570 DEFPROCopen(w%,behind%,send%)
  580 LOCAL f%
  590 IF w%=ib% ENDPROC
  600 !bl%=w%
  610 SYS"XWimp_GetWindowState",,bl% TO
;f%:IF(f%AND1)ENDPROC
  620 bl%!28=behind%
  630 IF send% SYS"Wimp_SendMessage",2,b
l%,w% ELSE SYS"Wimp_OpenWindow",,bl%
  640 ENDPROC
  650 :
  660 DEFPROCscan_keys
  670 LOCAL k%,v%
  680 SYS"OS_Byte",121,9 TO ,k%
  690 SYS"OS_Byte",121,&82 TO ,v%
  700 IF v%=255 AND k%<>255 THEN
  710 SYS"OS_Byte",202,0,255 TO ,v%
  720 v%=v% AND &48
  730 SYS"Wimp_GetCaretPosition",,bl%
  740 PROChotkey(!bl%,k%+512+(v%<<8))
  750 ELSE
  760 dblbounce%=FALSE
  770 IF v%<>255 curwin%=-1
  780 ENDIF
  790 ENDPROC
  800 :
  810 DEFPROChotkey(w%,k%)
  820 CASE k% OF
  830 WHEN &270
  840 !bl%=0:$(bl%+4)="!HotKeys closed d
own"+CHR$(0)
  850 SYS "Wimp_ReportError",bl%,&11,tas
k$
  860 quit%=TRUE
  870 ENDPROC
  880 WHEN &264:PROCpush_windows:ENDPROC
  890 WHEN &243:PROCpop_windows :ENDPROC
  900 WHEN &A31:PROCopendir("@"):ENDPROC
  910 WHEN &A12
  920 *FILER_OPENDIR ADFS::Winnie.$
  930 ENDPROC
  940 WHEN &A13:PROCopendir("%"):ENDPROC
  950 ENDCASE
  960 :
  970 IF (k% AND &4000)=0 SYS"Wimp_GetPo
interInfo",,bl%:w%=bl%!12
  980 IF curwin%>0 w%=curwin% ELSE curwi
```

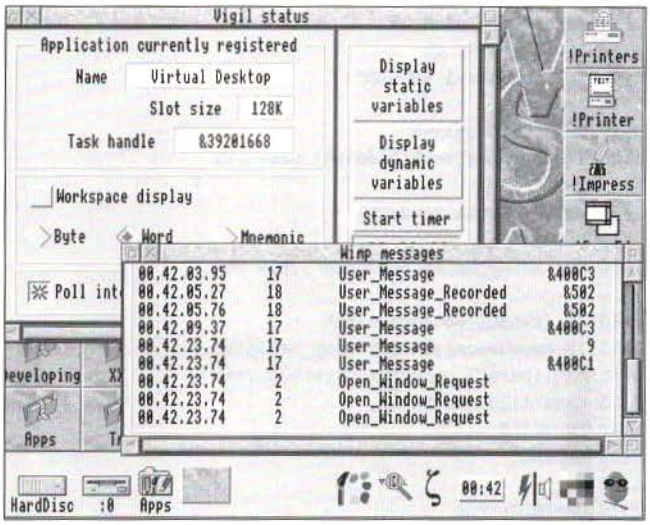
```
n%=w%
  990 IF w%>0 !bl%=w% :SYS"Wimp_GetWindo
wState",,bl%
 1000 IF (w%<=0) OR (bl%!32 AND &800)=&8
00 THEN
 1010 IF k%<&200 SYS"Wimp_ProcessKey",k%
 1020 ENDPROC
 1030 ENDIF
 1040 CASE k% AND &BFF OF
 1050 WHEN &229 :PROCopen(w%,-2,TRUE)
 1060 WHEN &239 :PROCopen(w%,-1,TRUE)
 1070 WHEN &219 :PROCpush_win(w%)
 1080 WHEN &279 :PROCpop_win(w%)
 1090 WHEN &A29 :PROCmove(w%,0,-1)
 1100 WHEN &A39 :PROCmove(w%,0,1)
 1110 WHEN &A19 :PROCmove(w%,-1,0)
 1120 WHEN &A79 :PROCmove(w%,1,0)
 1130 WHEN &214, &209, &20B
 1140 IF NOT dblbounce% SYS"Wimp_SendMes
sage",3,bl%,w%
 1150 dblbounce%=TRUE : curwin%=-1
 1160 OTHERWISE
 1170 IF k%<&200 SYS"Wimp_ProcessKey",k%
 1180 ENDCASE
 1190 ENDPROC
 1200 :
 1210 DEFPROCopendir(dir$)
 1220 LOCAL l%
 1230 IF version% < 300 ENDPROC
 1240 SYS"XOS_FSControl",37,dir$,bl%+28,
,,228 TO ,,,,,l%
 1250 IF l%>= 1 THEN
 1260 !bl%=256:bl%!4=0:bl%!8=0:bl%!12=0:
bl%!16=&400:bl%!20=0:bl%!24=0
 1270 SYS"Wimp_SendMessage",17,bl%,0
 1280 ENDIF
 1290 ENDPROC
 1300 :
 1310 DEFPROCpush_win(w%)
 1320 PROCopen(whandle%,-2,FALSE)
 1330 SYS"Wimp_GetWindowState",,bl%
 1340 WHILE bl%!28<>w%
 1350 !bl%=bl%!28
 1360 SYS"Wimp_GetWindowState",,bl%
 1370 IF bl%!28=-1 ENDPROC
 1380 ENDWHILE
 1390 IF!bl%<>whandle% PROCopen(w%,!bl%,
TRUE)
 1400 ENDPROC
 1410 :
 1420 DEFPROCpop_win(w%)
 1430 IF bl%!28>0 THEN
 1440 !bl%=bl%!28
 1450 SYS"Wimp_GetWindowState",,bl%
 1460 PROCopen(w%,bl%!28,TRUE)
 1470 ENDIF
 1480 ENDPROC
 1490 :
 1500 DEFPROCmove(w%,x%,y%)
 1510 bl%!4=bl%!4+x%*32
 1520 bl%!8=bl%!8+y%*32
 1530 bl%!12=bl%!12+x%*32
 1540 bl%!16=bl%!16+y%*32
 1550 SYS"Wimp_SendMessage",2,bl%,!bl%
 1560 ENDPROC
 1570 :
 1580 DEFPROCpush_windows
 1590 LOCAL next%
 1600 IF version% < 300 ENDPROC
 1610 IF hidden% <> -1 ENDPROC
 1620 SYS"Wimp_CreateMenu",,-1
 1630 SYS"Wimp_GetCaretPosition",,caret%
 1640 PROCopen(whandle%,-2,FALSE)
 1650 SYS"Wimp_GetWindowState",,bl%
 1660 next%=bl%!28
 1670 WHILE next%<>-1 AND hidden%<maxw%
 1680 !bl%=next%
 1690 hidden%+=1
 1700 wstack%(hidden%)=!bl%
 1710 SYS"Wimp_GetWindowState",,bl%
 1720 next%=bl%!28 : bl%!28=-3
 1730 SYS"Wimp_SendMessage",2,bl%,!bl%
 1740 ENDWHILE
 1750 ENDPROC
 1760 :
 1770 DEFPROCpop_windows
 1780 LOCAL prev%, f%
 1790 IF hidden%=-1 ENDPROC
 1800 prev%=-1
 1810 WHILE hidden%>=0
 1820 PROCopen(wstack%(hidden%),prev%,TR
UE)
 1830 !bl%=wstack%(hidden%)
 1840 hidden%-=1
 1850 SYS"XWimp_GetWindowState",,bl% TO
;f%
 1860 IF (f%AND1)=0 prev%=!bl%
 1870 IF prev%=!caret% SYS"Wimp_SetCaret
Position",!caret%,caret%!4,caret%!8,care
t%!12,caret%!16,caret%!20
 1880 ENDWHILE
 1890 ENDPROC
 1900 :
 1910 DEFPROCerror
 1920 ON ERROR OFF
 1930 SYS"Wimp_CloseDown",task%,&4B53415
4
 1940 PRINT REPORT$;" at line ";ERL
 1950 ENDPROC
 1960 :
 1970 DEFFNwimperror(bl%,errno%,err$,tas
k$,ok%,cancel%)
 1980 LOCAL flag%,response%
 1990 !bl%=errno% :$(bl%+4)=err$+" "+STR
$errno%+CHR$(0)
 2000 flag%=ok%+(cancel%<<1)
 2010 SYS "Wimp_ReportError",bl%,flag%,t
ask$ TO ,response%
 2020 =response%
```

Vigil - The Spy on the Desktop

Robin Watts does a little detective work with this new Desktop debugger.

Debugging tools for the Archimedes have traditionally been expensive, and really only within the price range of dedicated programmers. Rheingold Enterprises, with its new Vigil Desktop debugger aims to change all this.

Vigil, billed *The Spy on the Desktop*, works by watching other Wimp tasks as they run, and displaying everything they do in separate windows.



Is your application sending and receiving the right messages?

When run, Vigil installs on the icon bar and waits for a task to be registered for debugging. This is achieved either by the application calling a SWI, or, more simply, by the programmer dropping the application on the icon.

Vigil immediately pops up its main *Status* window. This shows the name of the application, its slot size, and task handle, and gives access to most of Vigil's facilities. How useful these are will depend largely on which language you are programing in.

BASIC

Most newcomers to the RISC OS environment start by writing simple applications in Basic. For them, Vigil is ideal.

Firstly, at the click of a button Vigil displays in a window a list of all the Wimp messages your program receives. This can be invaluable for checking that your program is actually receiving the messages you think it is, and in the right order. For first-time programmers of the Wimp, I can see this being very useful.

Secondly, Vigil allows you to view the contents of all the program's variables. Integer, floating point and string variables are all listed in a window, and you can even change the values of integer variables in your program while it is running, either to correct errors, or just to try out different values. It seems a shame however, that the variable editing facilities are restricted to the integer ones - being able to change floating point or string values would be a definite boon.

Useful though this facility is, it has a few drawbacks that are perhaps not immediately visible. The first and most obvious is that Vigil can only list the variables that Basic actually holds copies of. This sounds confusing until you remember that Basic 'forgets' the values of LOCAL variables as soon as it leaves the procedure in which they are defined.

The second problem is that Vigil can only produce a 'snapshot' of the variables. The variables could all change from the values shown within milliseconds of them being displayed, and so the values given have to be taken with a pinch of salt.

Both of these problems are surmountable and so should cause little trouble as long as you remember them, but the next one is less trivial to avoid, as it is buried deep in the way that Vigil works. Being a Wimp task, Vigil can only display the values of variables, or update an application's workspace display, on Wimp polls, and not as things change. This means that you can only check up on a program's progress when it passes control back to the Wimp.

In fairness, it should be said that these problems are not unique to Vigil. Any debugging program running under the Wimp will suffer from these deficiencies in one way or another, and Vigil copes with them as best it can.

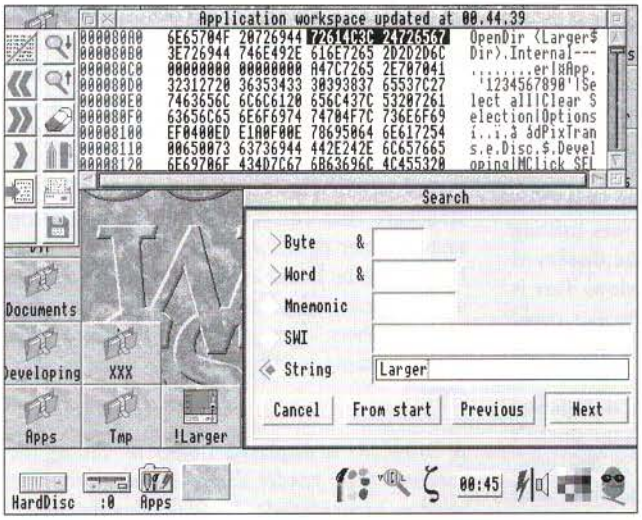
To solve the problem of variables changing quickly, there are facilities within Vigil to have the task being debugged trigger the update of the values displayed on the screen, but the limitation that only one set of variables can be shown per Wimp poll still exists.

A worthwhile addition to the package could perhaps have been a facility to display the changes in a given variable or variables over a period of time, perhaps annotated with the messages that were sent to or from

the task, so the change of a variable as things happened could be clearly seen.

ARM ASSEMBLER

For the ARM Code programmer, Vigil provides slightly different facilities. Obviously the variable listing facilities are gone, but to replace these, a SWI is provided that records the current values of the registers, and flags them for display on the next Wimp poll. This means that programmers can track what is changing within their program at each stage, again subject to the constraint that only one such display per Wimp poll is possible.



Searching for a string in an application's workspace

The feature of Vigil that gives it its billing of Spy on the Desktop comes into play here. Vigil can peek at the workspace of the task it is watching, and display it on screen. While for Basic or C programs this facility is more useful for examining areas of data, perhaps to check on a sprite's palette, view a parameter block, or see if a file has loaded at the expected place, for ARM code programs it comes into its own. Both the program and data can be shown disassembled in a scrollable window, that updates itself as often as you like (no more than once per second). The user can freeze this update, change some values, and transfer it back to the task just by clicking on a few buttons.

As well as letting you peek at the workspace of Wimp tasks, Vigil also lets you examine the code or workspace of any of the modules running in your machine, and can produce lists of their SWIs and star commands. Running modules can even be saved to disc by just dragging an icon to a Filer window.

THE C LANGUAGE

I fear that of all the common Archimedes programming languages, the worst catered for is C. Since C code is compiled, Vigil cannot display variable listings, and as the code produced by a C compiler bears little or no resemblance to the source code, displaying the ARM code doesn't really help. Even the facilities to dump the ARM registers to the display are of little use, as there is no way to tell what will be in which register, so the values displayed will probably be meaningless. The workspace can be watched of course, but then, unless you get your program to tell you where the important addresses are, it may not be possible to tell what is being stored where.

The outlook is not all bleak though. With a little thought, a simple SWI veneer can be put together that moves values into registers and calls the SWIs, so that some information can be gleaned from the program. This is nowhere near as straightforward as it is with the other languages, however, and it would have been nice to have seen a simple veneer like this supplied with the package, rather than leaving the heavy work to the user.

These criticisms are probably a bit out of place though, as most users of C will probably have the Desktop Debugging Tool (DDT) already, and so will use that.

CONCLUSION

Vigil is a program that does what it sets out to do very well. It is very simple to use, has a clear manual, and a budget price tag. Both new and more experienced users of the Wimp, whether programming in Basic or ARM code, will find it invaluable in sorting out the intricacies of programming the Desktop, and if this is what you want, then this is the program for you. If you are interested in debugging software that runs outside the Desktop, or programming the Desktop in C, then I suspect it is time to invest in Acorn's considerably more powerful and expensive *Desktop Development Environment.*

PRODUCT INFO

Product	*Vigil*
Supplier	*Rheingold Enterprises* *7 Waterbridge Court,* *Appleton,* *Warrington WA4 3BJ.* *Tel. 0925 210657* *Fax 0925 210657*
Price	*£24.95 inc. VAT*

Desktop C - Handling Draw Files

David Spencer continues the new series on practical C programming.

In last month's article we showed how to display sprites in a window. This time we will look at the complementary issue of handling Draw files - that is files in the format created by Draw.

There are two distinct levels at which Draw files can be processed. The simplest involves treating the file as a black-box that can be displayed within a window, or part of a window. This is typical of a DTP package where the user could create a frame and drop a Draw file into it. All the DTP package needs to do is to ensure that the drawing contained within the file is displayed when needed. What the DTP package doesn't need to do is to edit the drawing in any way. However, there is a class of applications that need to manipulate Draw files rather than just load them. The level at which this needs to be done depends on the application. In some cases it might be as simple as extracting each object from the file one-by-one, while in a more complex scenario, full editing might be required - such as within Draw itself. RISC_OSLib provides separate sets of functions for these two different tasks.

RENDERING DIAGRAMS

We will look in detail at only the simplest level, which in Acorn terminology is referred to as the diagram level interface. The functions required for this are defined in the header *drawfdiag.h*. One of these functions is *drawfdiag_init()* which must be called before any of the functions described below are used. The call returns True if everything initialises OK.

The first step in displaying a Draw file is to load it into memory. For this you are on your own, as no help is provided by RISC_OSLib. Basically all you need to do is to check that the file is of the correct type, find its size, claim a block of memory of this size with flex, and then load the file into the block. You then need to create a tag to the Draw file in memory in the form of an object of type *draw_diag*. A *draw_diag* is a structure which holds a pointer to the data (*draw_diag.data*) and the length of the Draw file (*draw_diag.length*). It is convenient to include the *draw_diag* structure at the start of the flex block holding the data itself.

Once loaded, a Draw file must be processed by calling *draw_verify_diag()*. This doesn't actually do anything to the drawing contained within the file except verify that it is a valid format with no errors. The call takes two parameters - the first is a pointer to the *draw_diag* structure for the Draw file, and the second is a pointer to a *draw_error* structure to hold details of any error found in the drawing. A *draw_error* is a structure that can hold either an operating system error or an internal Draw error. The format can be found in the *drawfdiag.h* header, and the header *drawferror.h* details the internal error numbers. *draw_verify_diag()* returns True if the drawing is OK, and False if there is an error.

A Draw file is displayed simply by calling the function *draw_render_diag()* in the appropriate window's redraw code. This call takes the form:

```
BOOL draw_render_diag(draw_diag *diag,
                      draw_redrawstr *r,
                      double scale,
                      draw_error *error)
```

diag points to the drawing, and *error* points to an error structure as already described. *r* is the redraw structure and can be cast directly from the corresponding *wimp_redrawstr*. *scale* is a floating point scale factor to allow zooming of the diagram. By default, the drawing is always displayed relative to the bottom left-hand corner of the window.

Whilst this is OK for displaying just a drawing, a more sophisticated package will want to include the drawing as just part of the window. There are two ways of shifting the position of a drawing. The best method is to modify the redraw structure passed to the redraw call to fake a different work area origin. A more brute force approach is to use the call *draw_shift_diag()* which modifies all the co-ordinates in the drawing to shift it permanently. This call takes the form:

```
void draw_shift_diag(draw_diag *diag,
                     int xMove,
                     int yMove)
```

where *xMove* and *yMove* are the amounts by which the drawing is moved.

Before we can present some sample code, there are a few more points to consider. Firstly, we need to know how big the Draw file is (i.e. its dimensions) so that we know how big to make the window. To achieve this, the call *draw_querybox()* is used. This takes a pointer to the drawing, a pointer to a structure of type *draw_box* and a flag that should be True to return the size in screen units, or False for Draw co-ordinates. The *draw_box* contains four elements, *x0*, *x1*, *y0* and *y1*, which hold the bounding box of the drawing. Another call, *draw_rebind_diag()*, can be used to make sure that the drawing does in fact have a valid bounding box. It is wise to make this call after calling *draw_verify_diag()* just as a safety precaution.

Secondly, if the drawing contains text objects it requires extra memory to be rendered properly, and we have to supply functions to allocate, extend and free this memory. This is done by passing pointers to three functions to the call *draw_registerMemoryFunctions()* (note the inconsistent use of upper case). We won't go into details here because very conveniently these functions can be *flex_alloc()*, *flex_extend()*, and *flex_free()*. This will become clear when we look at the example code.

Listing 1 contains three functions for displaying drawings. *load_draw()* loads a Draw file of a given name, taking into account the claiming of memory, and calls the second function, *resize_draw()*, to set the extend of the window in which to display it. This second function should also be called each time the scale factor (passed as *zoom*) changes. The function *redraw_draw()* actually displays the drawing in a window, and should be called from the window's redraw loop. The functions assume that the global variable *window* exists. This is of type *wimp_w* and holds the handle of the window.

There are three points that should be noted about *resize_draw()*. Firstly, note the way the window extent is set to have the origin at the bottom left-hand corner and not the top left as is the convention. The reason for this is that drawings always have their origin at the bottom left. Secondly, the actual origin is not set to (0,0), but to the lower limits of the bounding box of the drawing. This will ensure that the drawing doesn't appear offset by an arbitrary amount. Finally, note the offsets of 16 added or subtracted from the window extent. This gives a small margin (16 OS units) around the drawing, so that it doesn't butt right up to the edges of the window.

The !DrawDisp application in action

One thing our example cannot cope with is the rendering of unknown types of objects in a drawing. As RISC_OSLib predates RISC OS 3, this includes rotated text and sprite objects. In order to handle such objects, an unknown object handler can be registered using the call *draw_set_unknown_object_handler()* which is described in more detail in the ANSI C Release 4 User Guide.

This month's magazine disc contains a full program based around the functions given here. It will load in a Draw file from within the application directory and display it in a window with a variable zoom. Please note that this doesn't support the rotated objects mentioned above.

EDITING DRAW FILES

The higher level of Draw file manipulation is provided by the functions defined in the header file *drawfobj.h*. These functions work on a Draw file loaded in as before, but allow more flexible manipulation of the drawing's contents. The various functions won't be described in detail here, as it would take up too much space.

The call *draw_create_diag()* will create a new empty drawing, which can subsequently have objects (lines, curves etc.) added to it using *draw_createObject()*. Existing objects can be deleted using *draw_deleteObjects()* and an object can be extracted with *draw_extractObject()*. The call *draw_doObjects()* will render just a specified subset of the objects from within a drawing. Details of all these called can be found in the ANSI C Release 4 User Guide. The header file *drawftypes.h* contains a large set of structure definitions to allow manipulation of each possible object type. The actual range of object types and their format is described in volume 4 of the RISC OS3 PRM, in the section on file formats.

Finally, if you really want to get your hands dirty, *drawmod.h* provides a set of functions that interface to the SWI calls provided by the Draw module. This is the module within RISC OS that is used to render paths such as lines and curves.

In next month's Desktop C article we shall continue our look at data presentation by examining how to format text and display it within a window.

Listing 1 - The Draw functions

```
/* Redraw viewer window contents */
static void redraw_draw(
            draw_diag *diagram,
            wimp_redrawstr *r,
            double zoom)
{
  draw_error error;

  draw_render_diag(diagram,
             (draw_redrawstr *)r,
             zoom, &error); }

/* Close viewer window */
static void close_viewer(void)
{
  if (viewerwindow_open)
    {
     wimpt_noerr(wimp_close_wind(window));
     flex_free((flex_ptr)&drawing);
     viewerwindow_open = FALSE;
    }
}

/* Set extent of viewer window */
static BOOL resize_draw(
        draw_diag *diagram,
        double zoom)
{
  wimp_redrawstr r;
  draw_box box;

  draw_queryBox(diagram, &box, TRUE);

  r.w = window;
  r.box.x0 = (int)(box.x0 * zoom) - 16;
  r.box.y0 = (int)(box.y0 * zoom) - 16;
  r.box.x1 = (int)(box.x1 * zoom) + 16;
  r.box.y1 = (int)(box.y1 * zoom) + 16;

  wimpt_complain(wimp_set_extent(&r));

  return TRUE;
}

/* Load Draw file */
static BOOL load_draw(
        draw_diag **diagramptr,
        char *name, double zoom)
{
  _kernel_osfile_block block;
  int size;
  draw_error error;

  if (_kernel_osfile(Osfile_Readinfo,
name, &block) == _kernel_ERROR)
    return FALSE;
  else
    size = block.start;

  if (!flex_alloc((flex_ptr)diagramptr,
size + sizeof(draw_diag)))
    return FALSE;

  (*diagramptr)->data = (char *)
        (*diagramptr
        + sizeof(draw_diag));
  (*diagramptr)->length = size;

  block.load = (int)(*diagramptr)->data;
  block.exec = 0;

  if (_kernel_osfile(Osfile_Load, name,
&block) == _kernel_ERROR)
    return FALSE;

  /* Register the memory allocation
functions needed for drawing */
  draw_registerMemoryFunctions(flex_alloc,
          flex_extend, flex_free);

  draw_rebind_diag(*diagramptr);

  resize_draw(*diagramptr, zoom);

  return (draw_verify_diag(*diagramptr,
&error));
}
```

Castle Ergo Keyboard for your Arc

Why should you want to make your Arc look even more like a PC, and how can you do it ? - Lee Calcraft has the answers.

Essentially the Ergo keyboard from Castle Technology is a replacement keyboard for the Archimedes, and the main reason why this is something special is that the keyboard uses the standard UK PC layout. But there are other advantages to this unit as we will see in a moment.

As you may be aware, the standard UK PC keyboard layout is different from that adopted by Acorn for the bulk of their 32-bit machines. The most important difference is that the Ctrl and Caps Lock keys are reversed, but there are also minor transpositions like the quotes and the @ key, and the different positioning of the backslash key.

If you have a PC at work and an Arc at home, you will probably find the transition between the two keyboards very tiresome. Half the time you try to hit the Ctrl key you will actually end up toggling the Caps lock, and so on. For such users there is a great deal to be said for using a PC style keyboard with the Arc.

But there's more: Acorn's A4 laptop uses the UK PC layout, and it is Acorn's intention that all future machines will have a PC style keyboard. A major reason for this is cost: PC keyboards can be purchased in the Far East for a tenner, whereas the Arc keyboard is a specially designed unit, costing much more. Also there is the question of standards - it is much easier if all keyboards can use the same layout - it's just a shame it has to be the PC standard!

Enter the Ergo keyboard. Essentially this is a high quality PC keyboard which has been modified to be compatible with the Archimedes (though not the A4, which takes a standard external PC keyboard). Special firmware inside the keyboard itself makes it behave exactly like a normal Arc keyboard.

To use the Ergo keyboard, you simply plug it into the socket on your Arc, plug your mouse into a socket at its rear, and away you go. The keyboard has one or two tricks up its sleeve: it can be configured for different languages by holding down certain keys at power-up, and it also boasts a proprietary feature whereby movements of the mouse can be emulated via the keyboard - allowing you to move the pointer around and make selections by using special key combinations.

In use the keyboard performed well. The key mechanism is membrane based, though the keys also 'click' at the point of contact. This is the way that the majority of PC keyboards work, but is very different from the standard Arc keyboard, which lacks this feature. Whether you like the tactile feedback is a matter of taste, though I suspect that those brought up on PCs will be more keen on it than those who cut their first teeth on the old BBC micro and the Arc. Certainly I find myself in the latter category, and look forward to the 'click-free' keyboard promised by Castle for early in the new year.

If you currently find yourself having to use both PC and Arc style keyboards, then the Ergo keyboard will save you much grief, and will without doubt improve your productivity. The fact that Acorn are planning to move over to the PC style in future machines is another reason for backing this option: when future machines become available you will be familiar with the new keyboard layout. But remember, the transition will take some time - I have been using the Ergo keyboard for two or three weeks now, and find that I still make annoying transposition errors: unlearning is a slow process!

PRODUCT INFO

Product	*The Ergo Keyboard*
Supplier	*Castle Technology*
	Ore Trading Estate,
	Woodbridge Road,
	Framlington,
	Suffolk IP13 9LL.
	Tel. 0728 621222
	Fax 0728 621179
Price	*£99 ex. VAT and delivery*

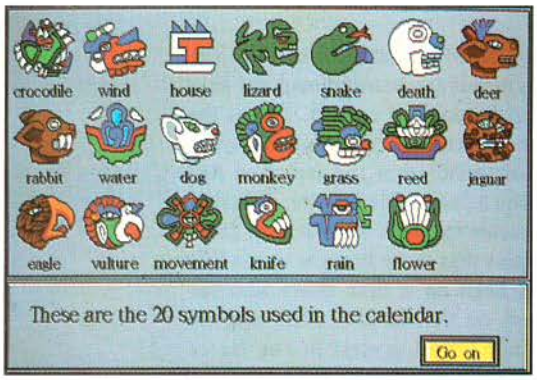
The Ergo keyboard is suitable for all Acorn 32-bit machines which are supplied with a separate keyboard. An adaptor for use with the A3000 is expected to be released in the new year.

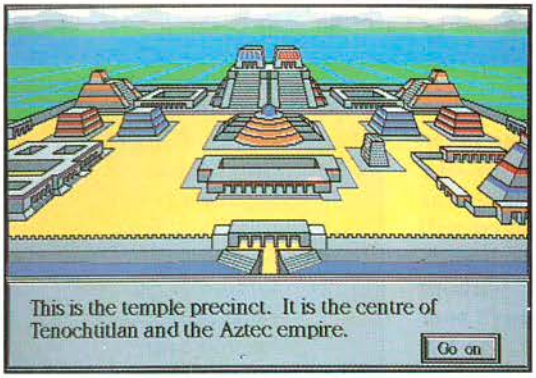
Aztecs and Naughty Stories

Mark Sealey looks at some of the latest educational software from Sherston.

INTRODUCTION

Sherston is everywhere these days: they even recently brought out a topic pack for the 8-bit machines (see last December's BEEBUG Education) and launched a crop of superb products at Acorn World. Sherston's *Aztecs* and latest *Naughty Stories* are reviewed here this month.





Aztecs

In 1991, for the first time, the attention of many pupils and teachers was drawn to the pre-Columban topic of the Aztecs as part of the Exploration and Encounters 'Core Study Unit' in the history National Curriculum. With few resources on the subject, this presented many schools with a headache. If books were lacking, how much more so was suitable computer software.

IN SEARCH OF SPICE

The programmes of study for this material suggest work on the geographical elements (maps in the late fifteenth century, the reasons for the early explorations, and life on the ships), a look at Montezuma and his empire (daily life, religion, technology and art), and the impact of the Spanish conquest.

Aztecs is an adventure in typical Sherston mode set in Tenochtitlan, Mexico in 1519. Montezuma had never been more powerful and the children who play the game have been thrown back in time to..., well, in fact to prove that an innocent person did not steal Montezuma's mask, of all things. But to do this, they have to find out along the way many of the things that the National Curriculum wants them to.

THE SCENARIO

After the usual, rather alarming grinding of Sherston's protected key disc you are introduced to Angus. It is his fault that you land in Mexico at all... a helicopter failure over the Bermuda Triangle. But you are soon immersed in learning about Aztec agriculture and eating habits (don't ask) and much else in the course of the adventure.

Throughout, certain hot spots on the screen are arranged by the patent Angus 'jet-pack' scanner. Clicking on one of these presents another screen or inset containing further information.

A key figure in the story is Neza, a slave woman whom you free. She gives you a shopping list (you learn the Aztec counting system), you meet her son (and learn about the calmacac, school for priests); but since the son, Tzoco, is very worried about his accused father he cannot concentrate on work to finish his calendar (you learn about Aztec dates and how names - your own included - are derived).

So it goes on; the celebrated designers of Aztecs have packed a wealth of material into the software and presented it well. It sends users around this fascinating world with just the right number of clues and opportunities for 'idle' curiosity as well; you never know what you will actually need to progress.

STRUCTURE

Throughout the day a conch sounds to provide feedback on the progress you are

making. You have only nine of the periods into which an Aztec day was divided to complete the search. To reinforce what is happening there is a map, which is easy to navigate around.

As usual with Sherston's adventures, the position can be saved from the Desktop (press Ctrl-Q) and restarted from the same spot just by clicking on the Aztecs icon on the icon bar. There are 26 possible starting positions and an option to save a screen as well as print it out. The level of difficulty can be set suitably for children working in key stage 2 (upper primary), and although Aztecs takes over the computer, it at least leaves other applications running in the Desktop unharmed.

SMALL MINUSES

It would be uncharitable to make too much of the one or two small niggles encountered when using this program with children... there is scope for confusion whilst clicking on the row of numbers during the counting session; it is not possible to move backwards to look again at certain of the otherwise clear text prompts; there are some rather spurious 'choices' at certain points, like the classic "Do you want to help?" where you know that whatever answer you give the only sensible one is "Yes".

In all other ways Aztecs is superb. The graphics look good in themselves, and the animations work smoothly and convincingly, yet have a style utterly in keeping with the grandeur and remoteness of this civilisation.

SUPPORTING MATERIAL

The documentation is well up to Sherston's usual very high standards: there are cards with the Aztecs' calendar and counting symbols, a map, an Aztec glossary and 'challenge' cards to stimulate further activity. These are excellent, as is the section in the teacher's book of no fewer than 16 pages of curriculum background.

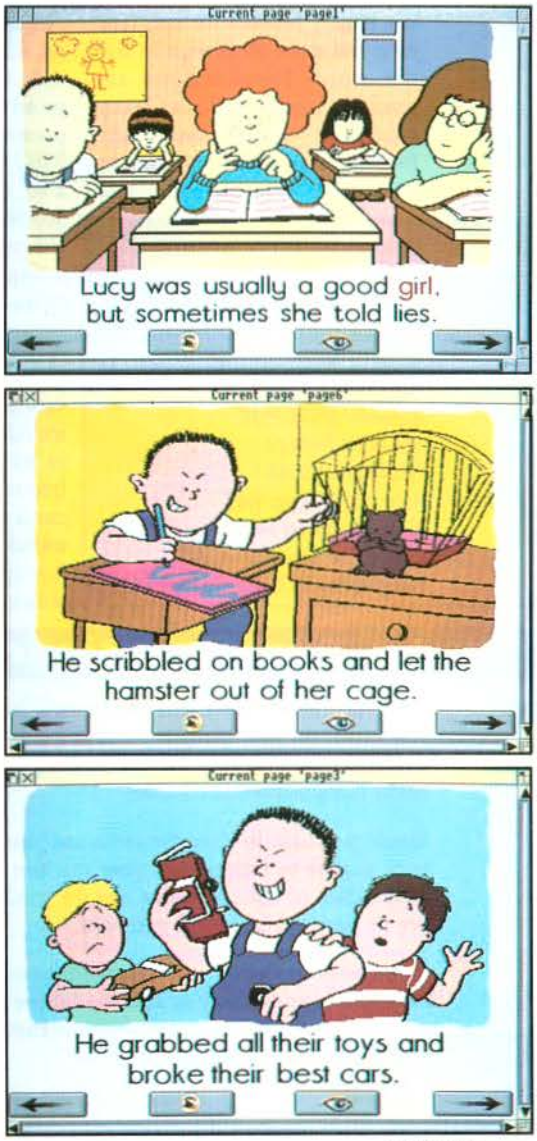
Aztecs is attractively priced, superbly presented, easy to use and cannot be recommended too highly; if this fascinating period falls within your remit this year (or you have any spare time to learn about it for yourself), the latest Sherston offering is indispensable.

Naughty Stories

Learning to read and stuck on a word, but there's no one to tell you what it says? Can't attract the teacher's attention? Teacher maybe tied up with the other 45 pupils in the class anyway? Help is at hand: a talking computer.

This latest set of six stories (*Series 2*) presents the usually young user with a single page on screen at a time (see figure 2). At the top is a graphic which can be simply and rather basically animated. At the foot there is a short sentence in an appropriate font for someone slowly becoming familiar with print.

Using a utility called *Playbook* the Naughty Stories can be made to sound, to speak in fact, the words on the screen. This can be one word at a time or the whole sentence. As each word is heard, it is highlighted to show the reader where they are.


Current page 'page1'
Lucy was usually a good girl, but sometimes she told lies.
Current page 'page6'
He scribbled on books and let the hamster out of her cage.
Current page 'page3'
He grabbed all their toys and broke their best cars.

Billy the Bothersome Bully from Naughty Stories

This is a simple idea, but effective. There is still much to be discovered about how children learn to read in the first place, and how they become more competent at it. It is a reasonably safe bet, though, that they use cues from a variety of senses: association and sound as well as sight for instance. Better still if they are motivated to read what is put in front of them!

Naughty Stories is working very much with the grain, here. The graphics are clear and appealing, colourful, stylish and appropriate to the age of the intended users. The sound is properly digitised and quite up to what is expected of it.

AND NAUGHTINESS?

There's something that will appeal to everyone here. Each of the six main characters (here as in the first series released last year) is just enough over the top to hit kids of key stage 1 between the eyes (and ears) and make them want to find out more. The storylines are genuinely funny; *Gordon's Groovy Granny* we should all like to meet for example. Children also learn by becoming familiar through repetition. Poor Gordon's refrain echoed at every one of Granny's antics is just one example of how text is made to further this process.

PRODUCT INFO

Products	*Aztecs*
	Naughty Stories 1 and 2
Supplier	*Sherston Software*
	Swan Barton,
	Sherston, Malmesbury,
	Wiltshire SN16 0LH.
	Tel. 0666 840433
	Fax 0666 840048
Prices	*Aztecs £39.95 ex. VAT*
	Naughty Stories £49.75 ex. VAT (Series 1 or Series 2)
	Naughty Stories 1 Activity Pack £13.95

IN PRACTICE

The set of 'books' can be installed on a hard disc, but you will still need the 'key' disc, which copy-protects the pack. Screens can be printed out using the standard RISC OS printer drivers. Using a 256 colour screen, Naughty Stories multi-tasks effectively, although they can be set to run as a single task from a two-option menu over the main window.

A further dialogue box is available from the icon bar. This alters various operations in the program including volume and the colour in which words are highlighted (red is the default). It also allows control over a potentially very useful feature indeed. This is the *log* option, creating a file into which go all the words that are clicked on in a session. This lets a teacher (or parent) examine those words which the child has - presumably - had difficulties with.

Controlling progress through the screens is easy and consistent with understandable icons, although these are all explained and illustrated in the accompanying teachers' book.

CONCLUSIONS

Naughty Stories work. Children DO want to persevere with the text. Concentration spans are short at this age, but the latest product from Sherston (which is sensibly priced) goes some way towards extending them to a purpose. There are Activity Packs to support Naughty Stories 1, particularly in maths and language; the activities are based around the characters you meet on disc and - like the text thereon - are well thought out and structured.

Just a Page (continued from page 17)

Your application is now ready to be used. Next time you switch on your computer and display the root directory you will have to type in your password before being allowed to continue.

Should you have to leave the room and you do not want anyone to tamper with your machine, simply double-click on the application and the window will pop up again asking for the password.

If you wish to change your password simply open the application directory as described above and use Edit to change the contents of the 'password' file.

Note: the version of this program on the magazine disc incorporates the password "unlock". Change this for your own as described.

This application probably isn't foolproof for experienced Arc users, but more often than not, it isn't experienced users you want to keep out!

```
10 REM Program   Lock
20 REM Version   A1.0
30 REM Author    Jimmy Imossi
40 REM RISC User Jan/Feb 1994
50 REM Program   Subject to Copyright
60 REM           Not Public Domain
70 :
100 ON ERROR GOTO 310
110 *FX200 3
120 C%=OPENIN"<Password$Dir>.Password"
130 password$=""
140 REPEAT:G%=BGET#C%
150 IF G%>31 AND G%<127 password$=pass
word$+CHR$G%
160 UNTIL EOF#C%
170 CLOSE#C%
180 PRINT 'SPC9;"- P A S S W O R D
P R O T E C T I O N -"
190 REPEAT
200 PRINT''" Password : ";
210 P$=""
220 REPEAT
230 G%=GET
240 IF G%>31 AND G%<127 AND LENP$<200
P$=P$+CHR$G%:PRINT"*";
250 UNTIL G%=13
260 UNTIL P$=password$
270 *FX200
280 SYS"Wimp_CommandWindow",1
290 END
300 :
310 REPORT:PRINT" @ line ";ERL
320 ON ERROR OFF
```

NOW! POEM 500 CNC SEWING MACHINE + ARC EMBROIDERY

The POEM 500 CNC embroidery machine, combined with TechSoft's Arc Embroidery software, offers a whole new sewing experience for students.

POEM 500

Unlike conventional machines, POEM has been designed from scratch to sit beside a computer. It is simplicity itself to operate, no buttons to press or settings to adjust, everything is controlled automatically. Just load the thread and the material, and go!

Arc Embroidery

With years of experience of designing CNC systems for schools, TechSoft have designed Arc Embroidery to have comprehensive features, while being very simple to use. Either a Sprite or Draw file may be loaded, scaled and positioned. Then, built in or user defined styles (ribbed, zigzag, satin stitch, etc.,) may be assigned to the different colours. Our unique stitching algorithms ensure unrivalled quality of output.

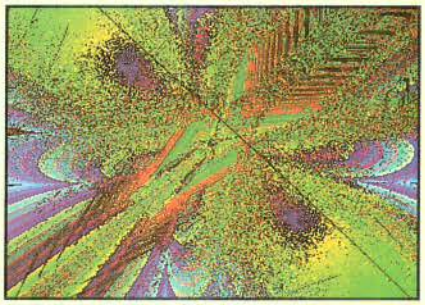
Technical: *Max stitching area 90 x 90mm : Max speed 300 stitches per min : RS232 interface : Supplied with large sewing frame, small frame available as an option : Sews on a wide range of materials : Optional thread stand for large bobbins available : 1 year*

Perspectives provides a simple means to interactively explore the concep of 3D design. The drawing screen shows three orthographic (1st or 3rd angle projection), and a pictorial window. The pictorial view may be in perspective, isometric, or oblique (the perspective view can also be rotate zoomed to any view point). Drawing takes place in any orthographic window. A wide range of drawing and transformation tools are available All views are active, allowing real time generation of 3D objects. A spe viewing mode allows rotation of objects in full STEREO 3D, for a spectacular aid to visualisation. Output of all, or any individual view, is a RISC OS printer driver, an HPGL compatible plotter, or as a Draw file.

RISC User Disc January/Febru

Just A Page

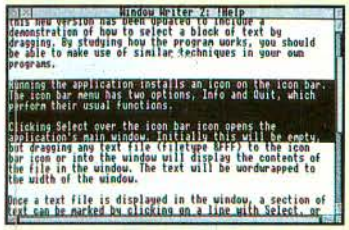
We have included two short programs from this month's *Just a Page* feature on the disc.



The first of these, *Chaos* produces intriguing patterns from apparently random processes, rather in the style of fractal patterns.

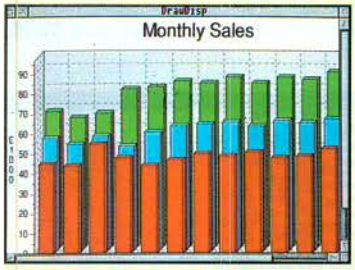
The second, *Lock*, allows you to lock up your system with a password so that only you can use it. You can also lock your system temporarily while it is still switched on.

Window Writer 2


Window Writer 2: !Help
This new version has been updated to include a demonstration of how to select a block of text by dragging. By studying how the program works, you should be able to make use of similar techniques in your own programs.
Running the application installs an icon on the icon bar. The icon bar menu has two options, Info and Quit, which perform their usual functions.
Clicking Select over the icon bar icon opens the application's main window. Initially this will be empty, but dragging any text file (filetype &fff) to the icon bar icon or into the window will display the contents of the file in the window. The text will be wordwrapped to the width of the window.
Once a text file is displayed in the window, a section of text can be marked by clicking on a line with Select, or

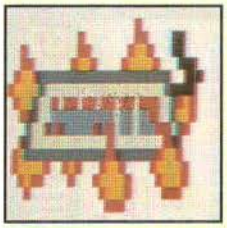
This application also comes from this month's *Wimp Topics* article, and illustrates how text displayed within a window can be highlighted by dragging with the mouse.

Draw File Displayer



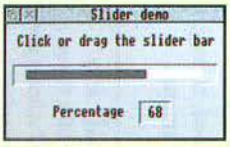
This application demonstrates how a Draw file may be rendered within a window on the Desktop as described in this month's article in the series *Desktop C.*

HotKeys



This is the version of the HotKeys program as listed in this month's magazine ready for you to customise as you wish. The application gives you direct keyboard control over many commonly used Desktop functions which can be difficult to activate

Slider Bars Demo

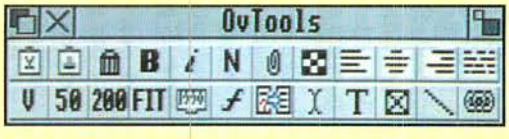


This little application demonstrates how slider bars may be implemented in your own programs, as described and explained in this month's *Wimp Topics article.*

ADDITIONAL ITEMS DESCRIBED IN THE MAGAZINE

Ovation Toolbox

This application will be a boon to all Ovation users. It provides a customisable toolbox, with 24 individual tools, which can be used as an alternative to Ovation's normal menu system to control many commonly used features of this popular DTP package. The toolbox can be attached to an Ovation document, aligned vertically or horizontally, and the tools repositioned to suit the needs of individual users.

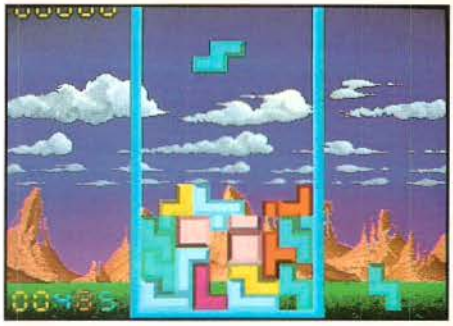


ry 1994

This action-packed disc costs just £4.75inc VAT.

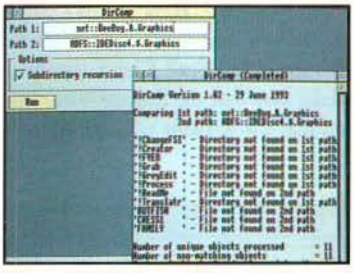
BONUS ITEMS

Cretin



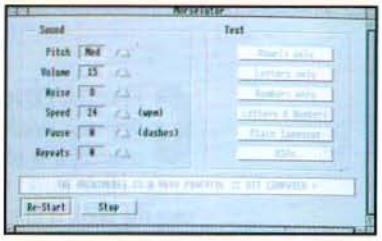
A clear head will certainly be needed to play Cretin, a highly polished implementation of one of the most popular of computer games. Even if you have never played the game before, this one is sure to delight - if its music doesn't drive you mad first. A Greek implementation of that Russian classic!

Directory Compare



We've nearly all experienced that uncertain feeling when we can't remember whether the contents of two directories on disc are the same or not. Is that really the latest version of that invaluable application. This updated application, first published on the disc for RISC User 6:8, now works on networks and will be of considerable interest to schools and other network users.

Morse Tutor

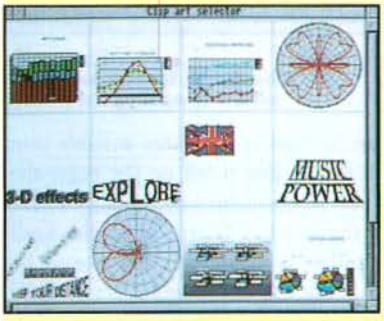


Morse code may not be everybody's favourite method of communication, but if you need to learn morse code for real, or are just interested in playing with the dots and dashes, this highly professional looking Morse Tutor is just the job. All aspects are controllable by the user, and you can even add increasing amounts of white noise into the morse transmission to give that extra touch of realism.

ArcScan Data

ArcScan Indexes for this month's RISC User and BEEBUG Vol.12 No.7.

Clipart Selector



This is a very powerful and useful application for storing and cataloguing Draw files (and sprites contained within Draw files), particularly clip art.
Minatures are created and displayed on screen together with user generated descriptions, and the application provides easy access and retrieval of the images.

Getting the Best from Ovation

Maurice Edmundson takes over the Ovation column and offers some further ideas on using Ovation for book production.

GENERATING AN INDEX

When a booklet or pamphlet has been created, it is often desirable to add an index to the whole work. Only when you are absolutely sure the book is in its final form should the index be constructed. Nothing is more tiresome than making late modifications to a book which then require corrections to its index, usually to the page numbers.

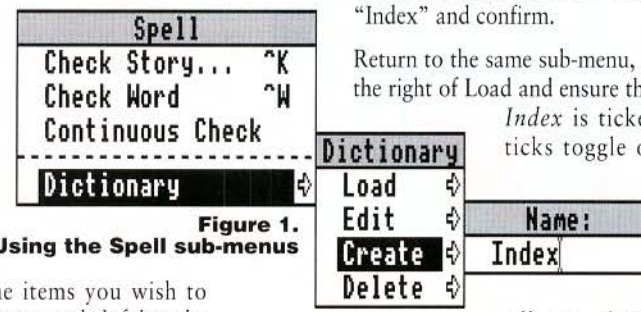


Figure 1. Using the Spell sub-menus

Give some thought to the items you wish to include in the index. It is just as unhelpful to the reader to have too many (often trivial) references to a topic as it is to find no reference to it at all. Some keywords may appear on lots of pages. It will be necessary to choose only the main references for these or else categorise them in some way.

Ovation does not have an in-built utility for indexing, but its wide range of features can be adapted to provide the user with much the same thing. The requirement is to extract from the pages of the book a list of key words, paragraph headings, names etc. complete with page numbers, sorted alphabetically and listed at the end of the book. To this end, prepare the index page(s) as a separate chapter at the end of the book. A chapter with the page(s) in two columns is usually satisfactory, together with a text frame along the top of the first page for the title "Index". Use the link tool to ensure that text will flow from one column to the next in the correct sequence.

We now have to search through the pages of text in order to select the references for the index. The principle behind the method I am about to describe is this: Ovation has a spell check feature with a facility for the user to construct a personal dictionary containing his own choice of words. When words are entered they are automatically sorted alphabetically and they can also be exported as a text file. This file, incorporating page numbers as well, can then be imported into the prepared index pages and hey-presto, the job is done.

A STEP-BY-STEP GUIDE

From the bottom of the main menu obtain the three sub-menus shown in figure 1 by sliding across from *Spell*, then *Dictionary* and finally *Create*. In the writable icon type "Index" and confirm.

Return to the same sub-menu, slide to the right of Load and ensure that only *Index* is ticked (the ticks toggle on and off - you don't want the *Main Dictionary* ticked). Have the first page of the book on screen and select *Check Story* from the Spell menu. The Spell Check window will appear. Make sure that the *Browse* button is highlighted and that the window is titled *Index* - see figure 2.

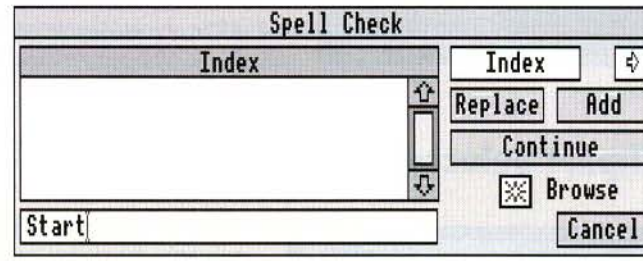


Figure 2. The Spell Check window when creating an index

You will see a word in the lower writable icon which will be the first word on the page; the word will also be highlighted on the page. I have pretended the word is 'Start'. Since the Spell Check window is active the caret will be positioned at the end of the word 'Start'. If by

any chance you wanted to include this word in the dictionary, and assuming you are on page 1, then from the keyboard add 1 without a space - 'Start1' - and click Select on the *Add* button. 'Start1' will now appear in the dictionary window. Select *Continue* and the next word in the text will be highlighted and written into the Spell Check window.

You could of course continue through the text one word at a time, but this is too slow and not a feasible method. Instead, run your eye down the text until you come to the next word which you wish to include in the index. This might be several pages ahead, say page 3. Suppose the word is 'printer'. Position the caret after 'printer' allowing one space between the last letter ('r') and the caret. Click *Continue* and the word 'printer' will appear in the writable icon with the caret at the end. From the keyboard add the page number '3' without a space, click *Add*, and printer3 is entered into the dictionary window.

Now proceed in a similar manner for all the other Index entries throughout the book:

1. Position the caret one space after the desired word.
2. Select *Continue*
3. Type in a page number - no space
4. Select *Add*

Each time you select *Continue* the marker in the text jumps to the word just in front of the caret, and when you select *Add* it is entered into the Index panel in the Spell Check window.

In practice the technique is very quick, and in a very short space of time you will have a dictionary containing all the entries you require for your index. Normally the dictionary would not allow the same word to be entered twice, but adding the page number makes each one different.

Referring to Fig.1, choose *Edit* from the second sub-menu. You can now browse through all your entries correcting any mistakes, adding an omitted word or page number, deleting an unwanted entry, etc. Click the Menu button over the Edit window to export the file to disc with a suitable name. Bring onto the screen the first of the blank Index pages which you prepared earlier. Drag the text file from its Filer window into the first column, and in a flash all the index entries are there in correct order, flowing from column to column as required. Mark the whole entry, and from the *Style* menu choose *Title*. This gives all the entries a capital initial letter which in my view looks neat and functional. Now go down the entries tabbing the page numbers one or two presses to the right into a tidy column of their own. At the same time insert a space between any double words. Your index is now complete.

Note, if the index is loaded into Edit first, it is easy to search for the page number at the end of each entry, automatically inserting a Tab character ([09]) in front of each one. When loaded into Ovation, setting the Tab position with the *Format* option will immediately line up all the page numbers.

KERNING

A brief word about Ovation's kerning facilities may be helpful too, as this seems to be a topical subject at present. As a rule kerning is relevant when using large type, e.g. 36pt and above, in news-sheet headings and the like. Manual kerning has always been possible with Ovation from the *Style* sub-menu. Enter the degree of shift required (±) and this is applied immediately to the letters as you type. Here are three examples:

AVAT. no kerning
AVAT. kerning -100
AVAT. kerning +100

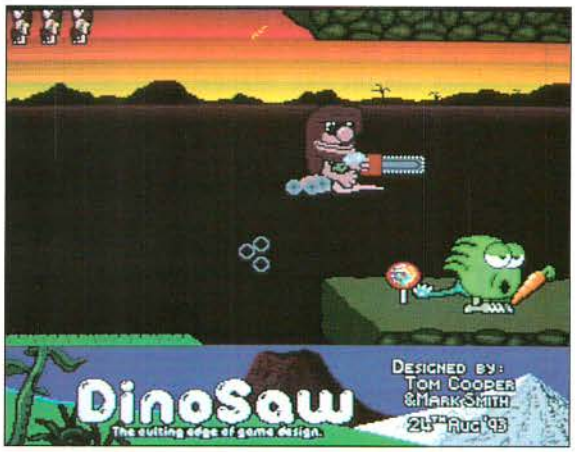
Fonts which are designed for RISC-OS 3.1 contain codes to adjust the space between letters where this would improve the look of the text. The latest version of Ovation (1.4) is able to utilise these codes to make the adjustments automatically as you type. The *Auto Kern* facility is available from the *Format* menu. When this is ticked, providing the font you are using contains the necessary kerning codes, the spacing will be adjusted as you type without any further action on your part. The Trinity font supplied with RISC-OS 3 has these auto codes built in, so you can try out kerning with that font. *Auto Kern* will compress the spacing for best effect, but if you wish to expand the spaces, for example to extend a given headline, manual kerning will still be necessary.

Note, RISC Developments will upgrade your version of Ovation if necessary for £5 if you return your original program disc.

Select and Collect

Simon Burrows shows that Public Domain games can offer just as much of a challenge and fun as the commercial sector, and at a fraction of the cost.

If you look at the catalogue of any good Archimedes Public Domain Library, you will find a section dedicated to games. How do these compare with games sold commercially? The reality is that selecting PD games can be rather a lottery; there are some very worthwhile titles, but also some rubbish. With few exceptions the Public Domain cannot replace commercial games, rather it complements them.



Tom Cooper's Dinosaw

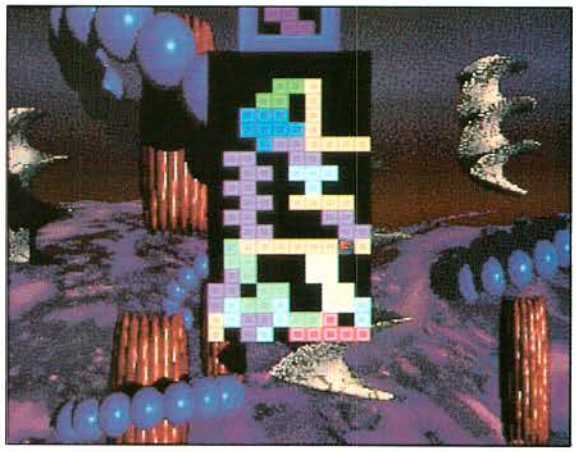
Commercial games are usually quite substantial, filling one or more floppy discs, and mostly take over the whole screen during play. PD games vary greatly in size and complexity, and there are numerous reasons for them being released in the Public Domain. You might expect that many PD games are simply not good enough to be sold commercially, and this is sometimes true. However, many such games are just not commercial enough for what is a highly competitive market, although they may be well written and great fun to play. Authors of good PD games are often snapped up by games companies to write hit titles, although some remain attracted to the PD market where enjoyment is the name of the game.

Mine Hunt

One obvious attraction of PD games is that they are very inexpensive to get hold of - ideal for filling the gap while saving up for that latest commercial blockbuster, or else for children who play a game for a few hours and then discard it, no matter how expensive it was. They can also be very useful in schools, where the purchase of commercial games could not be justified, but a few PD games can usefully be used as an end-of-lesson treat.

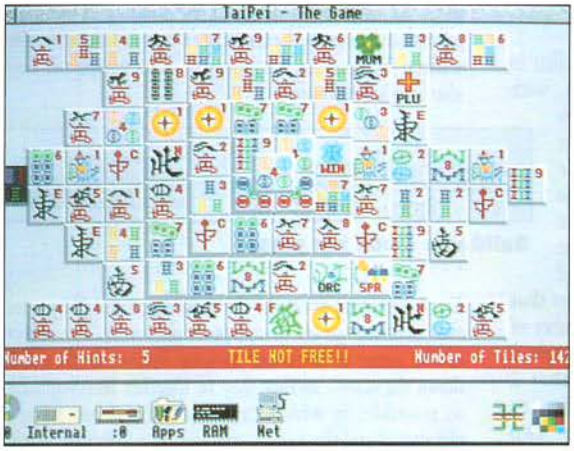
DINOSAW

One of the most prolific authors of PD games is Tom Cooper, also known as the author of commercial titles such as *Ixion*, *2067BC* and *Cycloids*. Tom's latest creation is *Dinosaw*, a topical platform game which involves dispatching dinosaws (sic) and negotiating the various levels. The graphics are colourful yet fairly simple, and if you have seen Tom's game 2067BC, there is no mistaking that it is one of his creations. The



Bloxed - The Tetris like game

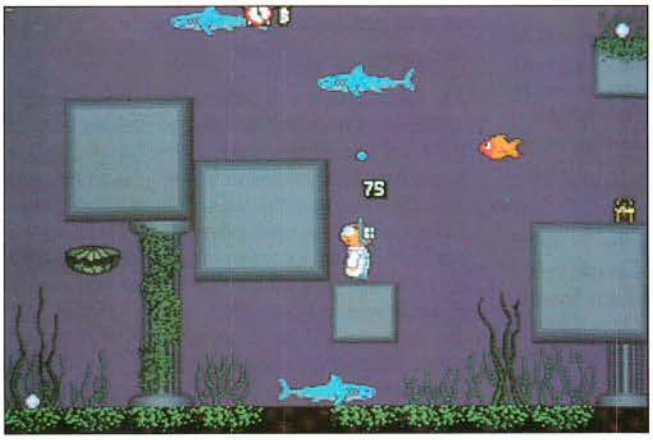
game features some blood when dinosaws are killed, so it is perhaps not suitable for a young child or those of a nervous disposition. If you have had a hard day at work or school, Dinosaw is just right for getting it out of your system! It will work on a 1Mb machine if you run the !MaxMem utility supplied, and also has extra features when run on an ARM3 based computer.



Taipei - Good graphics but demanding

SON OF GYRINUS

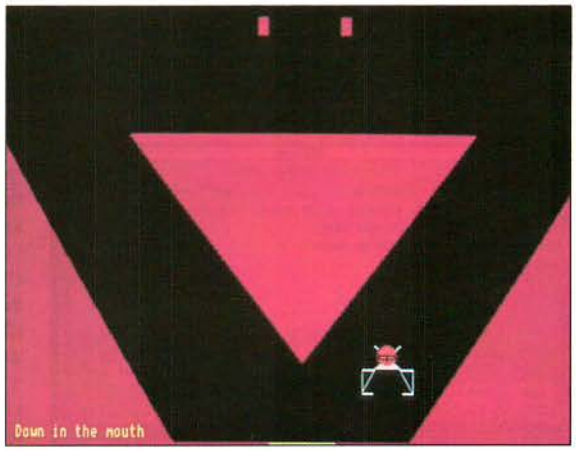
This is another popular title from Tom Cooper. This time you take the rôle of a scientist exploring various laboratories, collecting flashing crystals as you go. Manual dexterity and thought are required to complete each level and avoid getting killed. Sometimes the baddies can be rather difficult to identify, and so the game has to be played a number of times before you recognise what to avoid and what to collect. Gyrinus is normally supplied in compressed form using an archiving program, and must be decompressed onto two floppy discs, a network server or a hard disc. Tom has written several other PD games, all of which are worth a look if you enjoy playing this sort of game.



Son of Gyrinus

PLANET LAND

PD games started appearing soon after the Archimedes was launched. Indeed, the first ever item of PD software which I saw was an implementation of the Battleships game. Many of these early PD games are similar in style and design to old BBC games, and some of them are still extremely playable. One benefit of older games is that they tend to occupy little space, so a large number can be fitted on one PD disc. A typical example, which I am currently addicted to, is *PlanetLnd* by Stuart Tyrrell. The scenario will be familiar to any BBC games player: you have to land your spacecraft on planet landscapes with only a thruster to prevent gravity taking its course and smashing you into little pieces. Each landscape gradually has more and more obstacles in the way of the landing pad. The graphics and gameplay are simple, but it definitely has that frustrating addictive quality.



The classic lander style of game

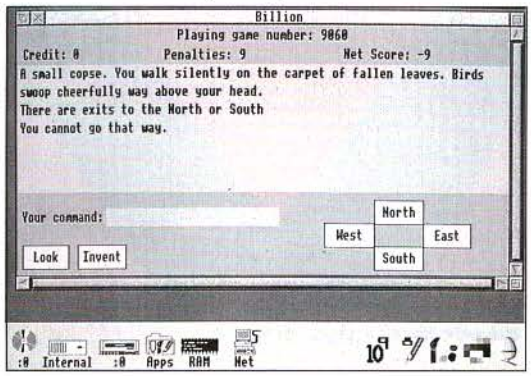
ICON BAR GAMES

One type of PD game which is particularly ingenious and surprisingly playable, is the icon bar game. These require you to squint at the game's icon on the icon bar, and actually play the game within the sprite! For example, in *BallGame* from Belgium, the traditional bat and ball game takes place within the game's icon! The bat is controlled by moving the mouse pointer around the screen, so you can't sensibly do anything else at the same time, although multi-tasking continues. Likewise

there is an implementation of the Game of Life called *PV_Life* which takes place entirely on the icon bar, written by Paul Vigay. Lee McGinty, author of many good PD games including an implementation of the Monopoly board game, has written two icon bar games, *Racer* and *ShootEmUp*, a car racing game and space invaders respectively. All use up very little disc space, memory and screen display, but are great fun to play.

MINE HUNT

MineHunt is a Desktop game which will be familiar in principle to users of Microsoft Windows 3.1, with which a similar game is supplied. A window containing a rectangular grid of identical icons is displayed, behind some of which are mines. The aim of the game is to flag the locations of all the mines, without actually being blown up by any of them. This is achieved by clicking on the icons one at a time; if a mine is revealed then it explodes and the game ends. However, if no mine occupies that square, a number is revealed indicating the number of adjacent squares which contain a mine. For example, a number 2 indicates that two adjacent squares contain a mine. The idea is to work out which squares must by implication contain mines, and mark them with flags. Once all of the mines have been identified, the level is complete. High scores can be record-ed for each level. Two different versions are widely available, both with the same name, written by Paul LeBeau and Michael Ellis respectively (a version under the name FlagDay was also published on the RISC User Volume 5 Special disc).



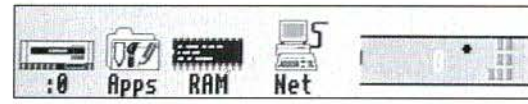
One of the Billion adventure games

BILLION

"A game a night until sometime in the 27,399th century"? That is the bold claim put forward by the adventure game generator *Billion* by William Tunstall-Pedoe, the author of *SuperGram* and *Cyber Chess*. It claims to provide one billion adventure games, no two of them identical, with the emphasis being on variety and amusement rather than a powerful parser and pretty graphics. The adventures won't keep you occupied for hours, but if you get bored by the monotony of normal adventure games, Billion will certainly give you something different.

TAIPEI

Taipei is said to be a 2,500 year old Chinese game, in which 144 tiles are arranged in the form of a Chinese Dragon. The objective is to remove "free" tiles until the board is clear. A tile is said to be free when it is at the left or right end of a row, and tiles may also be stacked on top of each other. The tiles have various designs, and only certain tiles can be removed according to whether their designs match. The RISC OS game of Taipei uses the mouse to select tiles, and even includes a "hint" option if you cannot see what move to make next. As with many of the most popular PD games, several different versions exist, the most notable are written by Andrew Ferguson & Alex Hopkins, and also Simon Lockhart.



BallGame - icon bar game

Tetris must rate as one of the most successful PD games ever, across a variety of computer platforms. The object of the game is to rotate various shapes as they fall down the screen so that they fit together as compactly as possible, in which case the lines of blocks are eliminated and the game continues. In a previous article (RISC User 6:8) I looked at the hugely popular implementation called *Tertis*, by demo-writing group SICK. However, I have since had a number of letters recommending *Bloxed* by Steven Singer - it appears that there are two main rival groups of Tetris players, those who like Tertis and those who think that Bloxed is the best. Both versions have special features over and above the traditional Tetris game. Bloxed features various nasty things, as well as power blocks which have special effects such as wiping out alternate lines of blocks. The two-player version can be particularly enjoyable to play, but don't try it if you wish to remain on speaking terms with your opponent!

CONCLUSION

The Archimedes is well endowed with Public Domain games, and I have only been able to mention a few of the better ones in this article. Several other excellent games have been covered in my previous articles, and are available from the RISC User Public Domain Library, as well as many others. Some PD games are not worth the disc space they occupy, but any good PD library should have weeded these out for you, and the Public Domain has something to offer everyone. For the home user, PD games provide an inexpensive and varied source of entertainment, while in the classroom they are useful for combining enjoyment with education, while not depleting any budgets. If you have come across a particularly good PD game, why not write in and tell us about it?

NOTE: All the games reffered to by Simon Burrows, and some more, are contained on a series of five discs (PDY5 to PDY9) which we have added to the RISC User Public Domain Software Library. Details are given elsewhere in this issue.

C Notebook: Hints & Queries

Compiled and Linked by Lee Calcraft

THE 3D SLAB BUG STRIKES AGAIN

Lee Calcraft

In RISC User 6:6 we warned of the fatal bug in the Window Manager which could strike if you use the new 3D slabbed icons (created on RISC OS 3 by using the 'R5' or 'R6' validation codes). Acorn's proposed solution was to use a special module called *Border Utils*, which we distributed on the 6:7 disc.

Unfortunately, this *fix* does not fix the bug in all cases. It works when a user clicks on a slabbed icon to quit an application, but is powerless in cases where a click on a slabbed *OK* button is followed by a *dbox_dispose()*, when the application does not quit as a result. These circumstances do not infallibly cause a crash - it seems that it only happens if your application grabs memory using *flex* immediately after the *dbox* disposal (thus scribbling over what the Window Manager stupidly thinks is still an active *dbox*).

The manifestation of this fatality is an address exception with an address which lies within the Window Manager's code (0x386b508 - 0x38857b7) - all my crashes have been at 0x3873b74. Fortunately, it can be fixed - by calling the following function immediately before disposing of a sensitive *dbox*:

```
void slab_bug_fix(void)
{
  _kernel_swi_regs r;
  int i;
  wimp_emask old_mask=event_getmask();

  event_setmask(0);
  do
  {
    _kernel_swi(OS_Mouse,&r,&r);
    event_process();
  } while(r.r[2] != 0);

  for (i=0; i<10; i++) event_process();
  event_setmask(old_mask);
}
```

AN ALTERNATIVE LINKER

David Pilling

There is a public domain linker called *Drlink*, by David Daniels which can be used as an alternative to Acorn's linker. It accepts object files in Acorn's AOF format and libraries in Acorn's ALF format, and links them to produce an executable image in either Acorn's AIF format or a plain binary image. It can also be used to link relocatable modules or to create partially-linked AOF files, and will be of use to those who do not have access to Acorn's linker, and to those interested in the extra features which it provides.

In particular it can generate throwback, and is able to link selectively in such a way that only functions which are actually used are linked from each library. Drlink can be downloaded from Arcade (081 654 2212).

EXCLUDING UNUSED FUNCTIONS

David Daniels

There is an undocumented flag (-zo) in the Acorn compiler in versions 3 and 4, which can create object code which is compartmentalised in such a way that subsequent linking can exclude non-used functions. Unfortunately, versions 3 and 4 of the compiler contain a bug that affects the addresses of character strings in the executable image when *-zo* is used: under certain conditions, these addresses are wrong. There is a workaround for this, however. If *-zo* is used, then *-fw* should be used as well, forcing string literals into the program's data area. Note that current versions of Acorn's linker do not support the selective linking of functions.

DeskEdit 3 DEBUGGING MACRO

Lee Calcraft

You can send debugging strings to the user scroller window in DeskEdit 3 by using the supplied library function scr_write() - for example:

```
scr_write("my_string is %s",my_string);
```

but the following macros can be used to save typing:

```
#define di(var) scr_write(#var " = %d",var)
#define ds(var) scr_write(#var " = %s",var)
```

If your source contains:

```
ds(my_string);
```

the preprocessor will automatically expand this to:

```
scr_write("my_string = %s",my_string);
```

The equivalent pseudo-function, *di()*, will do the same for integers.

Please send us your C hints - all published hints will be paid for.

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Wimp Topics - Dragging Objects

Alan Wrigley explores the techniques involved in moving objects around with the mouse, with the help of some ideas and routines by Keith Vernon.

The scope that RISC OS offers programmers for making programs easy to use is one of the delights of Acorn systems. Among the powerful features it provides is the ability to control the movement of objects both within and between windows, by dragging them with the mouse pointer.

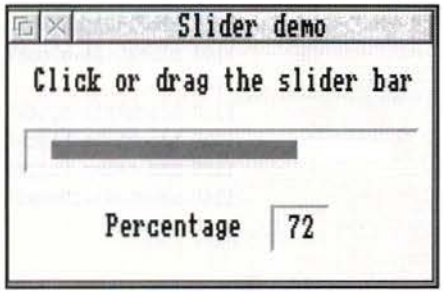
Dragging between windows is usually required when saving or loading files, and this has been adequately covered in previous RISC User articles such as *Mastering the Wimp* (RISC User 3:10 - 4:2) and in the book *Wimp Programming for All.* However, there are many situations where it is necessary to drag objects wholly within one window, and this article, together with next month's, will look at how to achieve this in your own programs. The particular situations we will cover this month are the creation of a slider bar, and marking a block of text in an editor. You should be able to adapt the principles described to other situations where dragging is required.

SLIDER BARS

At its simplest level, a slider bar is extremely easy to create, and can have a marked effect on the overall appearance of an application. You could consider providing a slider bar for any situation where a visual display of a value lying between fixed limits would make your program easier to use. Some examples are sound volume, RGB colour content, visual indication of elapsed time and so on (though the last of those would not normally involve dragging).

The RISC OS 3 Style Guide defines how slider bars should appear, and you can see what this looks like by using the *Sound* option from the *Configure* application, where the volume is set by a slider bar. The slider is actually composed of three separate icons - an unfilled icon with a 3D border makes up the slider well; a second icon with a white background makes up the slider background (which becomes visible over the part of the range not currently covered by the slider); and the slider itself is mid-grey (colour 5), and expands and contracts over the background. The slider bar in *Configure* only alters when the user clicks on one of the arrow icons provided, but we will concentrate on making a slider move if it is dragged or clicked itself. The slider bar therefore needs a button type of *click/drag*, while the background must be click. If you want the slider to respond to clicks over the well, that should have a *click* button type too.

To implement a slider, then, you should start by creating the three icons. The well must have a lower icon handle than the background icon, which must have a lower handle than the bar. For the purpose of our example we will assume that the handles are 0 (well), 1 (background) and 2 (bar). If you add a further icon (with a handle of 3) which is indirected and will hold a percentage value relating to the position of the slider bar, plus some textual description icons, you will have a window that looks something like Figure 1 (we won't bother with arrow icons at the moment). We will also assume that you are calling "Wimp_Poll" with a mask in *mask%*, which is initially set to 1 (i.e. null codes masked out).



A typical slider which shows the three separate components clearly (see text)

Now we need to detect when the user has clicked on, or dragged the slider. You might think that you need to detect clicks over the bar or background separately from drags on the bar itself, but owing to the way the Wimp works, you can make use of a shortcut. If you start a drag operation whenever you receive a button event on either icon, whether it is a drag or just a simple click, then in the latter case you will receive a *User_Drag_Box* event immediately, indicating that the drag has stopped, which you can process just as if it was a real drag. In other words, you can treat all button events on the slider icons as drags and everything will work correctly. So your mouse click procedure would contain:

```
CASE icon% OF
 WHEN 1,2:PROCdragbox
 .......
```

PROCdragbox itself starts the drag process, and is similar to procedures which initiate a save box drag, though with some significant differences. To start with, you do not want a rotating dash box around the slider as you drag, so you must use drag type 7 which provides an invisible drag point. You must also confine the drag to the maximum and minimum end points of the slider. In the example here, we will assume that the slider bar is 400 units long, which makes it easy to calculate the percentage by dividing by 4. The complete procedure will look like this:

```
1000 DEF PROCdragbox
1010 !block%=whandle%
1020 SYS "Wimp_GetWindowState",,block%
1030 x%=block%!4-block%!20
1040 y%=block%!16-block%!24
1050 block%!4=2:   REM icon number
1060 SYS "Wimp_GetIconState",,block%
1070 block%!4=7:   REM drag type
1080 block%!8+=x%:block%!12+=y%
1090 block%!16+=x%:block%!20+=y%
1100 block%!24=block%!8:block%!28=block
%!12
1110 block%!32=block%!24+400
1120 block%!36=block%!20
1130 SYS "Wimp_DragBox",,block%
1140 mask%=0:oldx%=0
1150 ENDPROC
```

You will see that block+24 (min x co-ord) contains the minimum x co-ordinate of the bar as returned by "Wimp_GetIconState", while block+32 (max x co-ord) adds 400 to this value. This restricts the drag to the required co-ordinates in the horizontal direction; vertically they are constrained by the y co-ordinates of the icon.

To be effective, a slider must have smooth movement - as the bar is dragged so the slider position must be continually updated to show the user the current state. This means that once the drag has been started, you must claim null events in order to keep track of the pointer position throughout the drag process. The line in *PROCdragbox* before the ENDPROC resets bit zero of the poll mask so that null events are now claimed. It also resets to zero a variable *oldx%*, which will be used in the null event routine. Your poll loop should deal with null codes by calling a procedure such as *PROCslider* described below, which will update the slider bar according to the current pointer position.

```
2000 DEF PROCslider
2010 SYS "Wimp_GetPointerInfo",,block%
2020 xp%=!block%
2030 IF xp%<>oldx% THEN
2040  !block%=whandle%
2050  SYS "Wimp_GetWindowState",,block%
2060  x%=xp%-block%!4:block%!4=2
2070  SYS "Wimp_GetIconState",,block%
2080  SYS "Wimp_DeleteIcon",,block%
2090  block%!4=whandle%:block%!16=x%
2100  SYS "Wimp_CreateIcon",,block%+4
2110  SYS "Wimp_ForceRedraw",whandle%,b
lock%!8,block%!12,block%!8+400,block%!20
2120  x$=STR$((x%-block%!8) DIV 4)
2130  !block%=whandle%:block%!4=3
2140  SYS "Wimp_GetIconState",,block%
2150  $(block%!28)=x$
2160  block%!8=0:block%!12=0
2170  SYS "Wimp_SetIconState",,block%
2180  WAIT:oldx%=xp%
2190 ENDIF
2200 ENDPROC
```

First of all the pointer x position is read and compared with the old value (*oldx%*). Provided it has changed, the slider bar icon is then deleted and re-created with its bounding box altered to reflect the new position of the slider. This does not redraw the icon; the simplest way to do this is to call "Wimp_ForceRedraw" to force a redraw of the total area of the slider bar. The percentage icon is then altered, and finally a WAIT command is issued to reduce screen flicker, and *oldx%* is reset to the new x position.

All that remains to be done now is to cancel null codes when the drag stops. This is achieved by including the following line in the poll loop reason code CASE statement:

```
WHEN 7:mask%=1
```

MORE COMPLEX DRAGGING

So far we have described a very simple case where an effective result can be achieved by using icons and no complicated redraw code. However, for many situations this would not be adequate. Take for example a text editor where you want to drag across a block of text to mark it. Not only would it be very restrictive to handle text using only icons, but as the area covered by the drag became greater, the redraw process would become more noticeable and eventually unacceptable. This is because taking the "Wimp_ForceRedraw" route forces the Wimp to clear the background before each redraw is

performed. In this case the text would be displayed by the window redraw method (see *Wimp Topics*, RISC User 7:1), and "Wimp_UpdateWindow" would be used during the drag to update the marked area. In most cases, the marking can be done simply by EORing the existing screen display with a new colour, making the process even neater.

If you refer back to the *Wimp Topics* article in 7:1, you will see that single lines could be marked, but not blocks. It is not difficult to amend the listings to allow the marking of blocks by dragging, though to keep the example as simple as possible we will impose some restrictions: only whole lines of text can be marked; Adjust will be ignored and only drags with Select will be detected; and the upper limit of the drag area will be the starting position of the drag (i.e. you cannot mark upwards beyond the point at which you clicked to start the drag). Once you understand the principles involved it should not be too difficult to add these features. We will assume that the window displays black text on a white background, with the two colours reversed when marked.

Instead of the single marker *mark%* we need two markers to indicate the top and bottom lines of the block (*mark1%* and *mark2%*, both of which should be initialised to -1 at the start), plus a variable *oldy%* which performs the same function as *oldx%* in the slider example above. We also now need to differentiate between clicks and drags, since a click must cancel the previous mark and start a new one. Referring to the last listing in *Wimp Topics* (RISC User 7:1), *PROCmouseclick* now looks like this:

```
2000 DEF PROCmouseclick
2010 ypos%=block%!4:button%=block%!8
2020 !block%=block%!12
2030 SYS "Wimp_GetWindowState",,block%
2040 xorigin%=block%!4-block%!20+4
2050 yorigin%=block%!16-block%!24-4
2060 y%=(yorigin%-ypos%) DIV 32
2070 CASE button% OF
2080  WHEN 4:  REM click with Select
2090  IF mark1%<>-1 PROCinvert(mark1%,
mark2%)
2100  mark1%=y%:mark2%=y%
2110  PROCinvert(mark1%,mark2%)
2120  WHEN 64: REM drag with Select
2130  block%!24=block%!4
2140  block%!28=block%!8
2150  block%!32=block%!12
2160  block%!36=ypos%:block%!4=7
2170  SYS "Wimp_DragBox",,block%
2180  oldy%=y%:mask%=0
2190 ENDCASE
2200 ENDPROC
```

If Select is clicked, the start and end points of the drag are initially set to the line on which the mouse was clicked, and a new procedure *PROCinvert* is called which marks the area from *mark1%* to *mark2%* (in this case just the one line). You will see that if there is an existing mark, the procedure is called twice, the first time being to invert the original block back to its natural colours before setting the new mark positions. If a drag is started with Select, lines 2130-2180 perform a similar function to *PROCdragbox* in the slider bar example, taking as the drag bounding box the visible co-ordinates of the window except for maximum y, which is set to the mouse position. You must make sure, of course, that your poll loop routine passes a button state of 64 (drag with Select) to *PROCmouseclick* if it occurs. The new procedure is as follows:

```
3000 DEFPROCinvert(a%,b%)
3010 !block%=whandle%
3020 block%!4=0:block%!8=-b%*32-38
3030 block%!12=1280:block%!16=-a%*32
3040 SYS "Wimp_UpdateWindow",,block% TO
more%
3050 WHILE more%
3060  SYS "Wimp_SetColour",55
3070  RECTANGLE FILL xorigin%,yorigin%
-a%*32,1280,2-32*(b%-a%+1)
3090  SYS "Wimp_GetRectangle",,block%
TO more%
3100 ENDWHILE
3110 ENDPROC
```

The parameters passed to *PROCinvert* are the start and end lines to be inverted. Lines 3020-3030 calculate the window co-ordinates to be passed to "Wimp_UpdateWindow", and the rest of the procedure forms the update loop, which inverts the rectangle containing the lines(s) concerned. Because we are updating rather than redrawing, the background is not cleared and there is little screen flicker. The value of 55 in line 3060 sets an EOR plotting action with colour 7. In all modes except 256-colour ones, this will invert black and white. For 256-colour modes you must use a value of 48 instead (see *Technical Queries*, RISC User 7:2 for an explanation of this).

Continued on page 55

HARDWARE AND SOFTWARE EXPANSION FOR ACORN COMPUTERS

DUAL RS423 SERIAL INTERFACE - two additional RS423 serial interfaces for communicating with RS423 or RS232 devices eg modems (in order to use bulletin boards), printers, plotters, instruments, etc. Up to four cards can be fitted in a computer.

IEEE488 INTERFACE - enables up to 14 test and measurement instruments, from well known manufacturers such as Hewlett-Packard, Fluke, Philips, Tektronix, etc. to be connected to the computer. For example, voltmeters, oscilloscopes, spectrum analysers, function generators, counters, logic analysers, programmable power supplies, plotters, printers, etc.

16 BIT PARALLEL I/O - provides two separate 16 bit input/output ports. Other facilities include four 16 bit counter/timers, two 8 bit shift registers and eight interrupt inputs. Applications range from measurement and control to high speed data input and output.

12 BIT ADC - provides eight single ended inputs each with an input voltage range of -5 to +5 Volts. Up to 166,000 samples per second can be taken.

STEbus INTERFACE - overcomes the limitation of a maximum of four expansion cards in a computer by enabling the use of industry standard STEbus boards in an external input/output sub-system for measurement and control applications.

SCSI DEVICES - internal and external hard disc drives, magneto-optical removable disc drives, tape streamers etc.

FORTRAN 77 COMPILER - completely compatible with the now discontinued Acomsoft compiler.

GINO-F 3D, GINOGRAF, GINOSURF and HERSHEY+ - the FORTRAN subroutine graphics libraries.

Intelligent Interfaces are Bradly Associates distributor for GINO-F 3D, GINOGRAF, GINOSURF for Acorn RISC OS-based Computers.

TERMULATOR - enables a computer to emulate a terminal from the VT range (VT52, VT102 or VT220) or a Tektronix 4010 graphics terminal.

Termulator a trade mark of Acorn Computers Limited is applied to this product under licence from Acorn Computers Limited.

COMPLETE SYSTEMS - configured to customer's requirements by fitting RAM upgrades, hard discs, expansion cards, etc.

ADVICE - SUPPLY - SUPPORT - Intelligent Interfaces were established in 1981 and have enjoyed a long relationship with Acorn Computers. This places them in an ideal position to advise on, supply and support systems purchased from them.

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INTELLIGENT INTERFACES

Into the Arc: Computer Programming

This month Mike Williams goes back to Basics.

Hands up all those of you who have never written a computer program! Don't worry; many users these days have probably never written a program, and indeed might not be too sure of how to go about it. We are all becoming much more user oriented these days, and if computers are to be widely accepted, not before time as well.

However, if it were not for the many excellent programmers around, we wouldn't have the RISC OS Desktop, we wouldn't have the wide range of applications software developed by commercial companies, and we wouldn't have the wealth of programs which we have published over the years in RISC User and on the RISC User magazine disc. So this month, in *Into the Arc*, I thought we would take a beginner's look at programming.

Now I don't expect to turn you all into expert programmers with a two-page article, but I would like to explore what computer programming is all about, what programming languages are used and why, and how programs are written.

At its simplest, any computer program is merely a set of instructions which tell your computer system how to perform some task. RISC OS, the Archimedes' operating system, is a program. it tells the computer how to respond when you use the mouse or the keyboard, and how to cope with the variety of tasks which you might carry out. For convenience, RISC OS is not supplied on a disc, but is built in to your computer by storing it in a ROM (or chip), in fact, four ROMs to be precise. This means, that with a little bit of help from the hardware, RISC OS and the Desktop starts running automatically as soon as you switch your computer on. Just as well, as your computer would otherwise be very difficult to use.

MACHINE CODE AND ASSEMBLER

Let's find out why. Any computer program is written in a computer language. Basic is one such language which you have very probably heard of. But that isn't suitable for writing an operating system, for reasons which I hope will become clear in due course. The computer's processor, the ARM chip, can 'understand' only a small range of instructions written in machine code, the computer's own language. If we can represent it at all, it consists largely of code numbers (representing instructions and references to memory locations). That's a bit simplistic, but it will suffice.

To create machine code programs, programmers use a more sophisticated version of the same language, called (on the Archimedes) ARM assembler. This uses mnemonics to represent instructions (like MOV for Move, CMP for Compare for example). Writing programs in assembler is a highly skilled job, requiring as it does, a real ability to think very much in terms of how the computer's hardware actually works. It involves fluency in the binary and hexadecimal number systems, because these also reflect the way computers work - no decimal numbers for them! Thus learning to program in assembler is not for the faint-hearted.

So do programmers use assembler that much? I guess the answer in general is 'No'. But for software like RISC OS, which sits very close to the hardware, it is almost essential. Likewise for applications where speed and timing are absolutely crucial, such as using a computer to control other equipment or to monitor sensors, assembler is again almost essential. And that applies to software to control digitisers, interfaces, disc drives, scanners and so on. But for most purely software applications the hardships of writing in assembler generally outweigh the potential benefits of speed, and even the fact that programs written in assembler usually need less memory to run than programs written in other languages. A few software houses do use assembler for just these reasons; Computer Concepts is one, and even companies like 4Mation and Stallion Software use assembler for some products where speed and economy of memory is highly beneficial.

BACK TO BASICS

So if programmers don't use assembler what do they use? Well one of the best known computer languages is Basic. Believe it or not, but Basic is nearly 30 years old. It was devised by two Americans, Kemmeny and Kurtz, in 1965, and the name is actually an acronym standing for *Beginners All-purpose Symbolic Instruction Code*. Basic was designed to be used by users, not programmers. In the sixties, programming was an impenetrable skill known only to relatively few. The object of Basic was to enable anyone to start writing their own programs. And Basic has become very popular for just that kind of reason. It is a very tolerant language - you can very quickly get down to writing a program just by trial and error. However, that doesn't mean that the end result will necessarily be a good program. Skill and experience are still called for, and as Basic has developed to become ever more complex and sophisticated, so the original objects of the language have faded.

Basic has another drawback, as a result of which it is a language often frowned upon by professionals and academics. Nobody ever managed to define just what Basic as a language consists of. As a consequence, virtually every version of Basic on every machine is different. Pick up any general textbook on Basic, and there will be features which are missing in the Archimedes BBC Basic, and that in turn has many features missing from other Basics. It's really been a free for all. Many versions of Basic have also been quite limited if not primitive compared with other languages, and hence the rather askance attitude of professional programmers.

However, BBC Basic, from when it first appeared on the very first 8-bit BBC micro in the autumn of 1981, has always been one of the best. And the version provided by Acorn on the Archimedes has many of the more sophisticated attributes that professional programmers seek. Yet for the beginner it is still very easy to get started.

Let's take a simple example. Use Edit's *Create* option from its icon bar menu and click on *BASIC* to start a program in Basic. A window will open and you then simply type in your instructions. Here is a fairly simple example for you to try out:

```
  100 MODE 12
  110 ORIGIN 640,512
  120 GCOL 0,1:RECTANGLEFILL -120,-64,24
0,128
  130 GCOL 0,14:VDU5:MOVE -68,8
  140 PRINT"RISC USER"
  150 REPEAT:UNTIL FALSE
  160 END
```

Just type in these instructions as you see them above making sure that you are scrupulously correct in every detail (computers are not very forgiving of the least mistake). Then use the Save option to save the program to disc by dragging the blue and white icon (which RISC OS uses to represent a Basic program) to a suitable Filer window. To run your program, simply double-click on the program's icon in the Filer window. The screen will clear and you should see the words "RISC USER" flashing in pale blue within a red rectangle. If you want to, reload the program into Edit (but make sure first that you have checked the *BASIC options* from Edit's icon bar menu to ensure that *Strip line numbers* is unticked, by clicking with Select on this option if you need to change it), and change the words in quotes to your own name. Save and re-run the program to see your own name in flashing lights.

Many of the instructions will be broadly understandable, even if you are unsure of any detail. The screen measures 1280 horizontally by 1024 vertically (in computer terms). The numbers in the program are mostly co-ordinates after moving the origin to the centre of the screen (640,512). A GCOL instruction selects a colour, 1 for red, 14 for flashing red/cyan. The REPEAT-UNTIL instruction at line 150 does a lot to do nothing: in effect it says "Do nothing" repeatedly. It prevents the program from stopping and messing up the display with messages. If you really want to stop the program running, just press Escape and follow the on-screen instructions.

If you haven't written a program of your own before, I hope you will give this one a go. It is quite satisfying, even with a small example like this one, to realise that the computer is doing just what you told it to. However, some thought will reveal a gap between what we have just done, and what I said earlier. How did our computer know what the instructions in our program were meant to do? The answer is that Basic is more

than just a name. In addition to RISC OS, every Archimedes has another machine code program built into its ROMs. The function of this program is to interpret the instructions in our program and tell the computer what it has to do in terms it understands. This program is called an *interpreter*, and in this case it is a Basic interpreter - the current version is Basic V. Again, one of the advantages of an Archimedes is that Basic is ready to run as soon as you switch on.

If you want to develop your Basic programming, then it does require hard work and perseverance. A good general textbook on programming in Basic will do much to help you develop the right ideas and techniques, and you would really need to obtain a copy of Acorn's *BBC Basic Reference Manual* if you really want to know the language inside out. To date there have been few books published on programming the Archimedes in BBC Basic, but the recently released *First Steps in Programming Acorn RISC OS Computers* from Sigma Press may be worth investigating.

It is also worthwhile to look at programs listed in magazines. Short programs like last month's *Beat the VAT Man* are ideal when you are just learning, and the short examples in our occasional *Just a Page* series are also nice and short to type in. Many now competent programmers have learnt their craft by examining and modifying programs written by others more knowledgeable than themselves. Provided this is only for your own interest and education, no one will mind, but you shouldn't modify other people's programs and then pass them off as your own. And you certainly shouldn't copy commercial programs and pass them onto your friends, modified or not, as you would almost certainly be breaking the law.

Most of the programs we publish in RISC User and on the magazine disc are written in Basic, and so is much commercial software. Increasingly, however, and particularly where more substantial programs are involved, commercial developers are these days shunning Basic and turning to a language called 'C'. However, to find out about C, and some of the other computer languages available for the Archimedes, you will have to wait till next time, when we'll also have a bit more to say about Basic interpreters.

Wimp Topics (continued from page 51)

Three more modifications need to be made to the program before all this will work. Firstly, you must provide a procedure which is called on null events, which updates the window while the drag is in progress. The code for this is as follows:

```
4000 DEFPROCprocessdrag
4010 SYS "Wimp_GetPointerInfo",,block%
4020 ypos%=block%!4:!block%=whandle%
4030 SYS "Wimp_GetWindowState",,block%
4040 xorigin%=block%!4-block%!20+4
4050 yorigin%=block%!16-block%!24-4
4060 y%=(yorigin%-ypos%) DIV 32
4070 IF y%<>oldy% THEN
4080  IF y%<mark2%:a%=y%+1:b%=mark2% E
LSE a%=mark2%+1:b%=y%
4090  PROCinvert(a%,b%):mark2%=y%
4100 ENDIF
4110 oldy%=y%
4120 ENDPROC
```

This procedure first finds out the pointer position and the window co-ordinates, then decides in line 4070 if the position has changed since the last call. If it has, line 4080 determines whether the new position is below or above the earlier position (i.e. has the block shrunk or expanded), before calling *PROCinvert* to invert any lines between the new and the old.

All that remains to do now is to cancel null events when the drag stops, exactly as with the slider bar example, and finally to alter *PROCredraw* so that multiple instead of single lines can be marked when a redraw is required:

```
1092 SYS "Wimp_SetColour",7
1094 IF i%>=mark1% AND i%<=mark2% THEN
1096 RECTANGLE FILL xorigin%,yorigin%-
i%*32,1280,-30
1098 SYS "Wimp_SetColour",0
```

This may all seem a little complicated at first, but is well worth pursuing since dragging really unleashes the power of RISC OS. This month's magazine disc contains fully commented examples of the topics covered here.

HINTS & TIPS

Keep sending in your hints on anything relevant to the Archimedes range. And remember, we pay for every hint we publish.

PRINTING POSTSCRIPT FILES FROM OVATION

John Wallace

Users of *Ovation* and the RISC OS 3 PostScript printer driver might be interested to know of the following rather obscure bug. If you import a Draw file, consisting only of a grouped object containing a path item and a line of text, into *Ovation*, when you attempt to print the file to a PostScript device, the text in the Draw file will be printed in the Corpus/Courier outline font, and not in the font you originally selected. The reason for this is that the RISC OS 3 PostScript driver requires that all fonts in a Draw file are declared, but *Ovation* causes it to ignore any font in a grouped object. RISC Developments is currently working on a version of *Ovation* that will fix this problem, but in the meantime, here is a simple solution. When you create the Draw file, type an extra character, e.g. a space, outside the grouped object, in the same outline font as the text inside the group. When you now print this file from *Ovation*, the text will be printed in the correct font.

MARKING BLOCKS IN DeskEdit

Lee Calcraft

The *DeskEdit* keyboard function Ctrl-Shift-M marks the line of text which contains the caret, and moves the caret to the next line. Holding down Ctrl-Shift-M enables you to select entire blocks of text, scrolling the window automatically in the process. However, using this method it is very easy to overshoot the end of the required block. To remove any unwanted text from the end of the selected block, simply move the caret to the correct end and press Ctrl-Shift-M again.

CREATING TIFF FILES WITH CREATOR

Alan Bonsor

The shareware application *Creator*, which enables you to convert images from Archimedes sprite format to foreign formats such as TIFF and GIF, has a bug associated with saving images directly to MS-DOS discs. If for example you set *Creator* to convert a sprite into a TIFF file, and then drag the TIFF icon from *Creator's* save box into an MS-DOS Filer window, when you later attempt to load the TIFF file into *Photoshop* on the Macintosh, *Photoshop* will inform you that it is unable to parse the TIFF file. The solution is to save the TIFF file onto an Archimedes disc or hard drive first, and then copy it onto the MS-DOS disc.

LOADING THE BorderUtil MODULE

Ken Cowap

Lee Calcraft's article *3D Icons for All* in RISC User 6:7 refers to Acorn's module for curing the RISC OS 3 bug associated with 3D icon types 5 and 6. Acorn's Help file accompanying the *BorderUtil* module on the 6:7 magazine disc suggests including a command in your Boot file to automatically load the module:

```
RMLoad <System$Dir>.Modules.BorderUtil
```

This can cause an error message:

Bad file name '.Modules.BorderUtil' during the boot-up sequence if it is executed in the Boot file before *<System$Dir>* is defined. An alternative worth trying might be:

```
RMLoad System:Modules.BorderUtils
```

after the system folder has been established. The order of commands in a boot file is obviously crucial.

STRANGE GOINGS ON IN HAUNTED HOUSE

Pieter Schmidt

So The Fourth Dimension's excellent Desktop adventure game, *Haunted House*, has left you in a state of absolute frustration. You've spent the last month trying everything possible to get out of the cellar, but you're still going round in circles. Well, without giving too much away, the secret is in the telephone numbers. They tell you whether to go forwards, backwards, left or right, and that's the clue!

PSYCHEDELIC LIGHT SHOW

Peter Lewis

In the days of the BBC micro, unusual peeks and pokes were the in thing, demonstrating strange and curious features of the computer. Well, what the Beeb could do, the Arc can do better, so play a SoundTracker or Digital Symphony module, and enter the following line in Basic:

```
SYS "OS_UpdateMEMC",760,1792
```

To disable the effect, either change mode with the MODE command, or enter:

```
SYS "OS_UpdateMEMC",1536,1792
```

You will have to be careful when you enter this line, as you won't be able to see what you're doing!

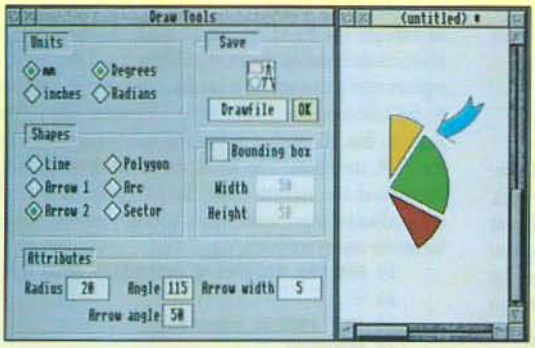
USING ShowPage WITH RISC OS 3

John Harrison

ShowPage, Computer Concepts' PostScript interpreter, doesn't seem to work under RISC OS 3. The problem is actually a very simple one, and the solution is even

RISC *user* Volume 6 Special Disc

The latest in our highly acclaimed series of RISC User Special Discs is now ready. Our aim with every Special Disc is to put together an interesting selection of the best applications from the previous ten issues of RISC User, augmented as always with a number of totally new and original items. Furthermore, previously published items will often have been updated in the light of user feedback.



Draw Tools

This powerful application is designed to work alongside Draw, Vector, ArtWorks or any other CAD package. It provides an 'object' toolbox for these applications for creating circles, arcs, lines etc, as well as straight and curved arrows. Based on an application originally supplied on the RISC User disc, Draw Tools has been almost totally rewritten to provide more functions and much more intelligent user interface.

Font Manager

An excellent application for managing the many fonts now available on the Archimedes in a simple and effective way.

Stencil

Create a multitude of stencil affects with your Draw files with the help of this application.

Guitar Player

A highly playable implementation of a guitar. Create and store chords; use the mouse to strum the strings; play along with RISC.

Outline Fonts

Two completely new and original outline fonts - Dynamic Shaded and Rob Roy, in normal and italic styles.

Pinboard Backdrops

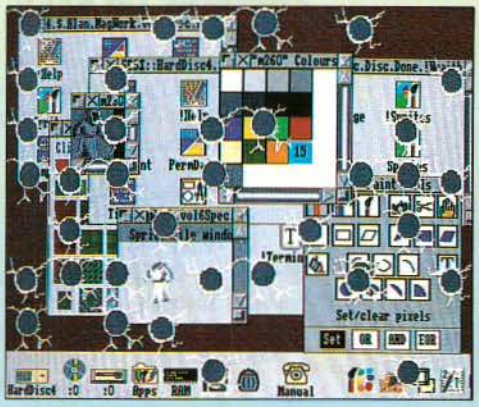
A selection of mood backdrops for use with the Desktop Pinboard

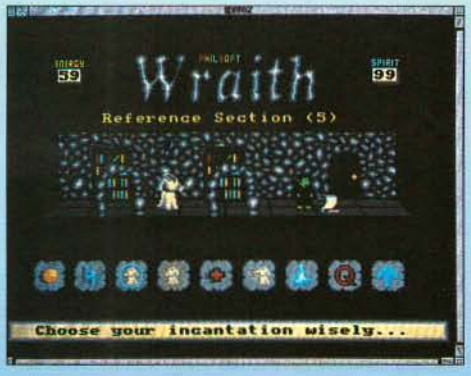
Terminator

A brand new novelty which produces startling consequences when you come to the end of a session.

Harry Organiser

RISC User's own personal organiser now updated for the Volume Six Special Disc.





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simpler. *ShowPage* cannot use the ROM-based versions of Trinity, Corpus and Homerton. Therefore, when you want to use *ShowPage*, install the original RISC OS 2 versions of these fonts, perhaps using the *Font Manager* supplied on the 6:9 magazine disc or the Volume 6 Special Disc, press F12 and type:

```
RMKill ROMFonts
FontRemove Resources:$.Fonts.
```

When you've finished using *ShowPage*, de-install the RISC OS 2 fonts, and enter the following commands:

```
RMREInit ROMFonts
FontInstall Resources:$.Fonts.
```

You could of course create two Obey files and run them from your sticky backdrop to save a bit of typing.

ZOOMING IN DRAW

Pieter Schmidt

One of the less well known features of RISC OS 3 *Draw* is the ability to enlarge a particular area of your work using the Shift key. Basically, instead of using the Zoom menu option, hold down the Shift key and use Adjust to drag a box over the area that you want to enlarge. To revert to the previous Zoom level, press Ctrl-R, and to go to full size, press Ctrl-D.

SPEEDING UP BASIC

Alan Bonsor

Although the *RMFaster command is not particularly useful for ARM3 users, it can provide a considerable speed increase on ARM2/250-based systems. Type in the following Basic program and run it:

```
10 *TIME
20 FOR X%=1 TO 1000000
30 NEXT X%
40 *TIME
```

While the ARM3-based A5000 will zip through this little routine in 3 seconds, an A4000 with an ARM250 will take a staggering 30 seconds. Now press F12 and type:

```
RMFaster Basic
```

and rerun the same program. On the A4000 (and on other machines without an ARM3) you should notice a not insignificant speed improvement - around 40% to be precise!

PLACING REM STATEMENTS OUTSIDE PROCEDURES

Alan Bonsor

Continuing with the subject of speeding up Basic programs, the positioning of a REM statement can have a considerable impact on the speed at which a loop or procedure/function runs. Take the following two programs for example.

Listing 1

```
10 *TIME
20 FOR X%=1 TO 1000000
30 REM The next line assigns 10 to Y
40 Y=10
50 NEXT X%
60 *TIME
```

Listing 2

```
10 *TIME
20 FOR X%=1 TO 1000000
30 Y=10
40 REM The previous line assigns 10 to Y
50 NEXT X%
60 *TIME
```

Both the programs perform identical functions, the only difference being that in listing 2, the comment and assignment have swapped positions. However, listing 1 runs almost twice as fast as listing 2. The reason for this is as follows. In listing 1, the Basic interpreter only needs to execute the REM statement once. As there are no instructions between the FOR statement and the REM, it realises that it can ignore it totally, and sets up a pointer to the following line. With listing 2 however, the pointer is set to line 30, as that is the first valid command after the FOR statement. The REM statement thus has to be interpreted one million times. To be totally on the safe side, always place comments totally outside loops, functions and procedures, e.g.

```
10 REM The following procedure does xyz
20 :
30 DEF PROCdo_something
40 ENDPROC
```

GETTING THE BASIC LOGIC RIGHT

Mike Williams

When writing conditional IF-THEN-ELSE statements in Basic, it is all too easy to write code which seems to be correct, but which doesn't work. For example consider the following statement:

```
IF X>=0 AND Data(X)=1 THEN
<do something>
```

Running a program containing a line like this will sometimes work, sometimes not. The problem arises because Basic insists on checking the logical value of both operands when evaluating the result of the AND operator. Thus X>=0 is evaluated first, and even if this is false, Basic will go on to evaluate Data(X)=1, although this is totally unnecessary (and invalid - if X<0 then evaluating Data(X) will generate a "Subscript out of range" error). The answer is to avoid the use of AND, and express the above statement in the form:

```
IF X>=0 THEN
IF Data(X)=1 THEN <do something>
```

ICONISING THE FORMAT/VERIFY WINDOW

John Harrison

Following on from last month's hint about speeding up verify operations by moving the *Verify* window off screen, the same speed increase can be achieved by simply iconising the *Format/Verify* window. This can be done by holding down the Shift key and clicking with Select on the window's Close icon. The only thing to remember is to de-iconise the window when the verify operation has finished, and click on the Close or OK button, otherwise you won't be able to access the disc.

MAPPING DOS EXTENSIONS

Lee Calcraft

One of the more obscure RISC OS 3 commands is the very useful **DOSMap*. This command is used for mapping MS-DOS filename extensions to RISC OS file types, thus allowing files on a DOS disc to be displayed with the correct RISC OS icons, and to run the correct application when you double-click on them. For example, a text file on a DOS disc has the extension .TXT, but unless the correct mapping has been set up, it will appear as a data file in a RISC OS Filer window, and you will have to hold down the Shift key and double-click on it to load it into *Edit*. By entering **DOSMap TXT FFF* at the command line however, all DOS TXT files will appear as standard RISC OS text files in the Filer window. Useful mappings to add to your Boot file include:

```
*DOSMap TXT Text
*DOSMap ZIP Archive
*DOSMap PCX PCX
*DOSMap DAT Data
```

COPYING WHILE VERIFYING

Pieter Schmidt

You might have noticed that while a disc is being formatted or verified, all the options on the disc menu are greyed-out, and, sensibly, you can't catalogue the disc either. However, it is actually possible to use the disc while it's being verified, though you should only do this if you're absolutely positive that the disc is error free. Click Menu over the Task Manager icon and in the *New task* window enter the command:

```
Filer_OpenDir ADFS::0.$
```

This will open a Filer window for that disc, and you can then copy items onto the disc while it is being verified.

A SAFER SAVE WITH DeskEdit 3

Lee Calcraft

One of the useful new features in *DeskEdit 3* is the automatic backup facility which can be customised by editing the *Overrides* file in DeskEdit's *Choices* directory (as described in the manual supplement). From then on the Safe-save facility saves, in the directory of your choice, a backup copy of any file saved from *DeskEdit*. When this backup directory becomes full, i.e. it contains the maximum 77 files allowed by the filing system, your first response might be to delete some of these files, but a smarter solution is to rename the backup directory (as an archive), and create a new, empty backup directory with the same name as the original.

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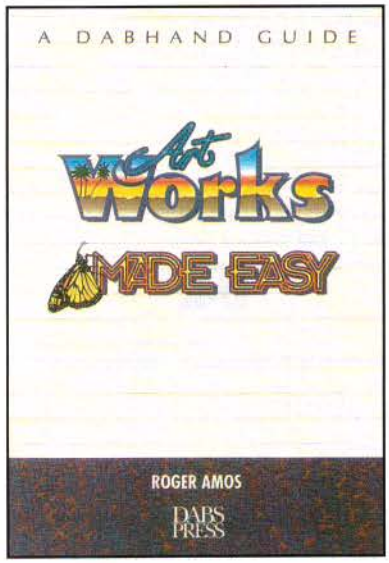
Book Reviews

Richard Hallas takes a look at three new beginners' guides to ArtWorks, programming and RISC OS itself.

ArtWorks Made Easy

by Roger Amos



Since its launch a year ago, ArtWorks has justifiably become a very popular drawing package. Although very easy to use, it is nevertheless highly sophisticated, and the fact that it works in a somewhat different manner to other RISC OS drawing packages makes it a little intimidating to the new user.

Roger Amos' new book is aimed at the first-time ArtWorks user, although it contains some sections which will be of interest to all users of the package. The book is 270 pages long, and contains a reasonably substantial amount of text per page, accompanied by plenty of illustrations. It aims to take new users through all the features of ArtWorks step by step, highlighting the differences between ArtWorks and Draw.

The book starts off with a quick overview of what ArtWorks can do, and follows it with a series of chapters on each of the main facilities: topics such as drawing shapes, creating text, handling colour, using layers, and printing, each merit their own chapters. Throughout, the book is written in an entertaining and informative style, and is quite an enjoyable read.

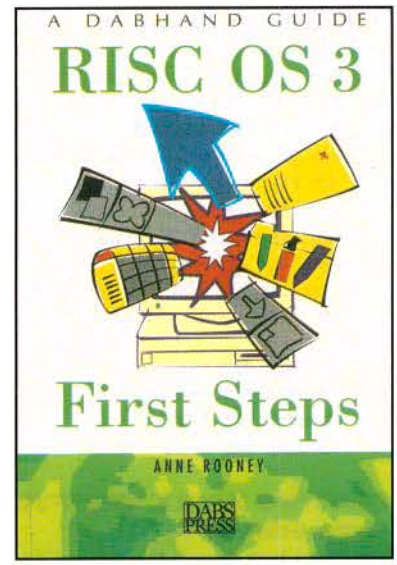
Although the book is of more relevance to beginners than experts, it nevertheless contains material for all users of the package. In particular, I found the explanation of colour handling and the colour models to be particularly valuable.

The book finishes off with a helpful chapter on printing, and a selection of hints and tips. It would have been nice if there were a few more of these: there are really only five, and the most substantial topic is a method of drawing town plans, which is a little specialised. A larger number of shorter, more general ideas for achieving particular results would not have gone amiss.

Altogether, this well-written book should be seriously considered by anyone who wants to be eased into using ArtWorks. For the average new user it should prove a good buy.

RISC OS 3 First Steps

by Anne Rooney



This book is aimed at both very new users and users who have upgraded from RISC OS 2, and it replaces the same author's previous title, *Archimedes First Steps*. With nearly 500 pages of quite closely-packed text, it provides good value in terms of quantity of material, even if it is not much less daunting than the similarly-sized manual supplied with the computer!

Despite its size, the book claims to put a lot of emphasis on getting started quickly. It is organised with the essentials, such as getting to know the Desktop, appearing first, and less exciting topics like system resources and programming coming later.

The initial *Looking at the Desktop* chapter is for brand new users. Bearing in mind the book's claim to help you get started quickly, I was a bit surprised at the amount of space spent on detailed systematic descriptions of things like the various window tools and unusual keys on the keyboard. It is necessary to read the majority of this 29-page chapter before you can actually do anything with the machine.

The meat of the book follows these introductory sections. Whole chapters are devoted to Edit, Paint, Draw, Maestro (including one musically nonsensical illustration), Alarm and the other applications supplied with the machine. The second half of the book is devoted to other aspects of using the machine: customisation, fonts, printing, system resources, programming, emulation and file transfer. Finally, there are sections on possible hardware and software additions, use of computers in schools, and support for special needs users.

RISC OS 3 First Steps is well-written and friendly, and reading the chapters individually will provide a good general introduction to each topic. I felt that a little rearrangement of some of the material would have benefited the book, as would a first 'hands-on' section to take a new user through some interesting things without necessarily explaining them in great detail. A few quibbles apart though, this is an approachable book despite its size, and will be more accessible to new users than the manual. However, existing users upgrading from RISC OS 2 should have enough with the manual provided as part of the upgrade.

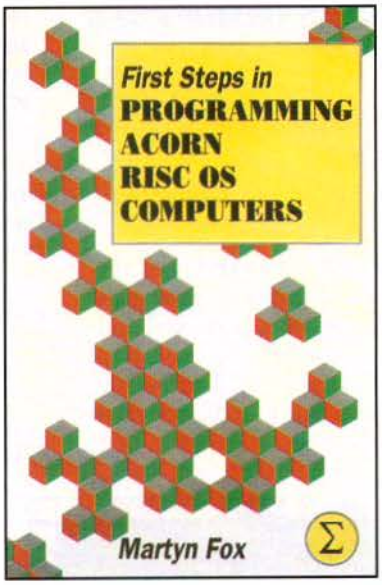
PRODUCT INFO

Product	*ArtWorks Made Easy RISC OS 3 First Steps*
Supplier	*Dabs Press Publishing Leyland, Preston PR5 3BR. Tel. 0772 623000 Fax 0772 622917*
Price	*£14.95 each*
Product	*First Steps in Programming Acorn RISC OS Computers*
Supplier	*Sigma Press 1 South Oak Lane, Wilmslow, Cheshire SK9 6AR. Tel. 0625 531035*
Price	*£14.95*

All three books are also available through Beebug.

First Steps in Programming Acorn RISC OS Computers

by Martyn Fox



There is no disputing that the RISC OS machines are absolutely wonderful for programmers. As well as some excellent third party development tools, the machine itself contains the fastest, fullest and most powerful version of Basic ever created, which even includes a machine code assembler. Given this fact, and also considering the large number of 'How to program...' books available for home computers in the 1980s, it is highly surprising that so far there haven't been any books about programming the RISC OS machines from scratch.

Martyn Fox's book aims to fill this gap. It is a companion to his other title, *A Beginner's Guide to Wimp Programming*, but should be read first if you're a new programmer. Just over 250 pages long, with plenty of text per page, the book takes you from the very first principles in the chapter *Making the Machine Do Something* right through to a brief introduction to *SWIs and Assembly Language*.

The book contains chapters on variables, loop constructs, functions and procedures, graphics and colours, sound, and understanding numbers. The chapters are ordered very sensibly, and there are always lots of short examples and small programs to help. Throughout, the author has injected the topics with a humorous and approachable writing style which really makes the contents quite easy to swallow.

In addition to the shorter programs, the book guides you through the programming of a simple game and a database program, and finishes up with a reference section listing all Basic keywords, complete with an example of each one's use.

Despite being slightly put off by the somewhat effusive and journalistic-sounding back cover, I found that this book really does provide an excellent beginner's introduction to programming, and despite its subject matter, is very approachable. If you need this kind of book, you should buy this without hesitation. uR

The PC Emulator Survival Guide (10)

by Gordon Gilmore

Delving into DOS is the theme of this month's Guide. In particular, we're going to look at the mysteries of the keyboard, including how to get the '£' sign, and provide some help for those who need to use the accented characters, much used in foreign languages.

PC Emulator (EGA CD 256K)
C:\COMMON>
C:\COMMON>kb fr
C:\COMMON>keyb fr,,\dos\keyboard.sys
C:\COMMON>
C:\COMMON>ECHO The auick brozn fox ju,ps over the lqwy dog!
The auick brozn fox ju,ps over the lqwy dog!
C:\COMMON>kb us
C:\COMMON>keyb us,,\dos\keyboard.sys
C:\COMMON>
C:\COMMON>ECHO The quick brown fox jumps over the lazy dog!
The quick brown fox jumps over the lazy dog!
C:\COMMON>

French keyboard support in DOS

IN ENGLISH PLEASE

First of all look at the following directory list:

```
KB       BAT      29        11-04-93 1:44p
EDCONF   BAT      31        11-05-93 10:49a
FOX      BAT      106       11-05-93 2:25p
PREP     BAT      106       11-05-93 2:24p
```

Now were those files created on 4th and 5th November or the 11th April and May? By default DOS uses the American date format:

```
month-day-year
```

This is something that I find annoying, but it can easily be altered so that all dates are presented in the normal English day-month-year format. Use either Edit in RISC OS or EDLIN in DOS to add the following line to your CONFIG.SYS file (if you are using Edit don't forget the [0d] end of line terminator, or use DeskEdit 3 with its new PC file filter):

```
COUNTRY=044,,C:\DOS\COUNTRY.SYS
```

Now our directory is reported like this:

```
KB       BAT      29        4-11-93  1:44p
EDCONF   BAT      31        5-11-93  10:49a
FOX      BAT      106       5-11-93  2:25p
PREP     BAT      106       5-11-93  2:24p
```

That feels more like home. Whenever the date is displayed by DOS, it will now be in the English (strictly speaking UK) format. But why doesn't DOS print the name of the month like RISC OS? You may well ask! It doesn't, and that is all there is to it.

FUNNY FOREIGN KEYBOARDS

DOS supports a range of formats for different countries and also allows the use of different keyboards to suit those countries. Word processing in French, for example, will need frequent access to all the accented characters like 'é' and 'à'.

I am sure you are aware that there is a whole range of characters which are not available to single keypresses on the keyboard. These are accessed by holding down the Alt key and typing a mysterious number on the numeric keypad. For example, Alt-247 at the DOS command prompt will produce the division symbol '÷' and Alt-156 will give the '£' sign. We will come back to this later but this is probably the simplest way to get the pound sign in DOS.

Some of these characters with the high bit set (which means that they have ASCII codes from 128 to 255) are the various accented characters necessary if you are writing in French. Now that is alright for the odd character now and then, but pretty tiresome when writing to your French pen-friend. DOS provides an answer by providing support for different keyboards.

As usual, this is a practical exercise, so run your Emulator and let's start by creating a short batch file as follows:

```
COPY CON KB.BAT
KEYB %1,,C:\DOS\KEYBOARD.SYS
^Z
```

(^Z is Ctrl-Z of course). If we type KB FR this will be interpreted as the instruction:

```
KEYB FR,,C:\DOS\KEYBOARD.SYS
```

which will load support for a French keyboard from the KEYBOARD.SYS file. Now if we press the '2' key we get e-acute, and the number '7' key produces e-grave. Wonderful, just what the French doctor ordered! Now try typing 'The quick brown fox jumps over the lazy dog' (see the first screenshot). We have a problem and that is that the characters have been mapped to the keys as they would appear on a French keyboard. Not a lot of good for us. To get back to where we were we must re-load the US keyboard:

```
KEYB US,,C:\DOS\KEYBOARD.SYS
```

which is difficult. The backslash character doesn't appear on the French keyboard, which is why we created the batch file. Just type KB US to return things to normal (if you didn't create the batch file you are now in trouble and will have to do a warm re-boot using Ctrl-Alt-Delete). According to the DOS manuals the backslash ought to be available by pressing Shift-Alt-8, but on my keyboard it doesn't appear.

"Is there a UK keyboard?" you may ask, and indeed there is, loaded by typing KB UK. If you try it you will find Shift-3 will give you the pound sign. One or two other characters will have moved - the '@' and the '"' swap places for example. The main problem with using the UK keyboard is that the backslash key, essential when working in DOS, has moved to a key between the left-hand Shift key and 'Z' which doesn't exist on the keyboard supplied with my Archimedes. As I suggested above there is a lot to recommend Alt-156 as an easy way of getting a pound sign in DOS.

There is a very interesting pattern provided for French-Canadian keyboards which has a lot of potential. Its combination of American and French facilities and can be loaded using the instruction KB CF. This keeps the main features of the standard keyboard but provides many extra characters. There are many changes to the keyboard and I have listed them in Table 1. In addition to the normal and shifted characters, a whole range of extra characters are available using Shift-Alt. In the table you will see a number of useful characters, including the pound sign, and some of the accented French characters.

Certain keys, '[', '"' and Shift-Alt-\, when pressed once, appear to do nothing, but when pressed a second time give the accents '^', '`' and '¨'. These keys are the means to getting even more accented characters. For example press '[' and then the lower case letter 'a' and the character 'a-circumflex' appears. This also works with the letters 'e', 'i', 'o' and 'u'. Grave characters can be obtained in a similar manner using the '`' key and lower case 'a', 'e' or 'u' and acute characters using the Shift-Alt-/. The c-cedilla, obtained by pressing ']' and then 'c', completes the set.

Using these keys with the upper case letters produces a strange mixture of characters (mind you, currency dealers who take their work home will find that symbols for pound, dollar, cent, yen, franc and peseta can all be found on the keyboard). The screenshot shows some of these extra characters used in text in the DOS version of PipeDream.

PC Emulator (EGA CD 256K)
Files Edit Layout Print Blocks Cursor F1=Help
A13
A B C D
Accented characters within Pipedream (DOS version)
Circumflex: ^ â ê î ô û (using [key)
Grave: à è ù (using ' key)
Acute: á é ÉCedilla: ç (using] key)
Mathematical characters: ± ² ¼ ½
Currency characters: £ ¢ $ ₧ ¥

Canadian-French keyboard used in PipeDream

If you have a need for these characters on a regular basis then it would be worth getting to grips with them, although a little re-labelling of the keyboard might also be useful. There is more.

CODE PAGES

A browse through the section on the keyboard in a DOS manual makes frequent reference to 'code pages'. The code page defines which character appears on the screen when a particular key code is received (KEYB determines which physical key on the keyboard produces which code). Up to five code pages can be recognised to take into account a range of different languages. For example, code page 437 is the United States set, and code page 850 the multilingual set. The latter is also referred to as a Latin 1 set, but is nothing like the Latin 1 set in ARM fonts unfortunately. The differences in these

The range of TurboDrivers has expanded to include versions for the Hewlett-Packard DeskJet and LaserJet range of printers, as well as the Canon bubblejet range. The latest release 3 versions are now fully RISC OS 3.1 compliant, offer new advanced features and are faster than ever before.

The bottom line is that if you value your time, the TurboDrivers are for you - they can render pages and give control back typically at between three and ten times faster than Acorn printer drivers or Ace PRODrivers. Indeed once the image has been rendered then the printing continues entirely in the background - as fast as the printer will go. This makes a large difference for just one page and an enormous difference if you are printing more than one copy of each page.

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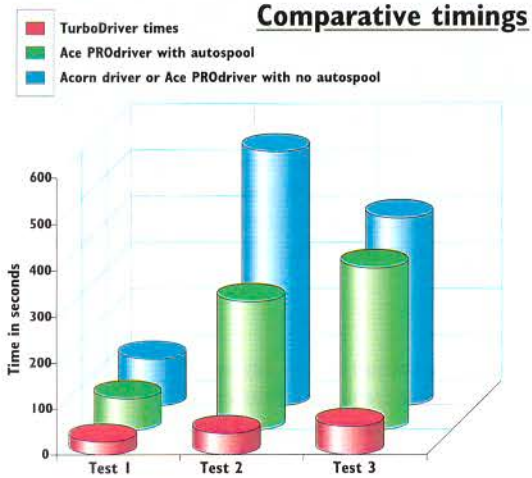
- **By far the fastest printer drivers available for Acorn 32-bit computers - see chart.**

RISC OS 3 Turbo DRIVERS

Comparative timings



Test1 - A single DTP page of text and scanned graphic images
Test2 - Two copies of a three page text and graphic document
Test3 - A complex full page of graphics from ArtWorks.

The timings indicate the time in seconds to get control back. All tests performed on HP DeskJet 500 printer using a 4Mbyte A440 with an ARM3 fitted. Other machine combinations show similar performance gains.

Illustrated are a selection of printers supported by TurboDrivers. There is constant development in driver support so please contact Computer Concepts for details of latest printers.

Canon TurboDrivers £49 + VAT (£57.57 incl.)
(supports all BJ-10, BJ-200, BJ-230, BJ-300 and BJC-800 printers)

HP TurboDrivers £49 + VAT (£57.57 incl.)
(Supports all monochrome and colour DeskJet and LaserJet printers)

Please specify printer type when ordering. The BJ-230 and all HP TurboDrivers are only suitable for RISC OS 3.1 machines. 2 MBytes required.

Computer Concepts Ltd

Gaddesden Place, Hemel Hempstead, Herts HP2 6EX Telephone 0442 63933 Fax 0442 231632

code pages are in the characters with codes above ASCII 128 (otherwise known as top-bit set or extended characters). Code page 437 has more graphics characters than 850 which has more accented capital letters and one or two extra symbols.

If you were to type CHCP at the DOS prompt, the response would be to tell you that you are using code page 437. That is the standard hardware defined code page, and is what you normally work with. At first sight the command CHCP 850 - change to code page 850 - should allow us to use the alternative character set but it's more complicated than that. The computer, the screen and the printer all have to be configured and told which code pages you are using. Although this may seem inconvenient it does allow flexibility in that specially tailored code pages can be loaded for uncommon languages. An additional complication is that code pages are not supported in a CGA display which can only use the hardware code page - much as ARM machines can only use the system font without extra effort.

Let's assume that we intend to use the Canadian-French keyboard and we want the extra flexibility of using code page 850. Step one is to add the following line to your CONFIG.SYS file:

```
DEVICE=c:\DOS\DISPLAY.SYS CON=(EGA,850,2)
```

This loads a driver to handle an EGA screen display with room for two code pages. Now re-boot DOS and type the following:

```
NLSFUNC
CHCP 850
MODE CON CODEPAGE PREPARE=((863,850)
C:\DOS\EGA.CPI)
KEYB CF,,C:\DOS\KEYBOARD.SYS
```

(type the MODE line and the following as one line). You could of course put this into a batch file for future use or to make it a permanent feature add it to your AUTOEXEC.BAT file. The 'NLS' in 'NLSFUNC' stands for national language support and is needed to interpret the code page information. The file 'EGA.CPI' referred to in the MODE instruction holds the character set. (the extension .CPI indicating that it is a Code Page Information file).

Now you should have the Canadian-French keyboard layout and the extra accented characters provided in code page 850. To check, try Alt-158. You should get a multiplication symbol rather than the peseta symbol which page 437 provides. You should now find that using the '[', ']', '" and Shift-Alt-/ keys you can get all the accented characters including capitals. As a bonus you will also have access to the code page 863 which again has a slightly different set of characters.

Characters which:					
have moved			are new using Shift-Alt-		
`	*	'	±		1
~		Shift-Alt-;	£		3
@		Shift-Alt-2	¢		4
#		`	ÿ	(¤)	5
^	*	[	¬		6
[		Shift-Alt-[	á	(¦)	7
]		Shift-Alt-]	²		8
{		Shift-Alt-'	ª	(³)	9
}		Shift-Alt-\	1/4		0
|		Shift-`	1/2		-
\		Shift-Alt-`	¡	(3/4)	=
'		Shift-,	Á	(§)	O
"		Shift-2	á	(¶)	P
<		\	»		V
>		Shift-\	«		B
/		Shift-3	°		N
?		Shift-6	µ		M
´	*	Shift-Alt-/	º	(¯)	,

Characters ''', '[', Shift-Alt-/ and ']' are used to type extra accented characters. Characters within parenthesis are only obtained using code page 850 (see text).

Table 1. Changes between UK and French-Canadian keyboard layouts.

A QUICK WAY OUT

Suppose you are using your Canadian-French keyboard and have a sudden urgent desire to return to the standard layout. It isn't like DOS to provide quick and easy solutions but in this case it does. Press Ctrl-Alt-F1 and you are back with the United States keyboard. To return to your previous keyboard use Ctrl-Alt-F2.

That's not all that there is to be said on code pages - we haven't configured the printer for a start but that is enough to chew on for now.

WRITE -- BACK

CONSUMING PASSION

I have been concerned about the ink consumption on my Epson Stylus 800 printer, so I consulted Epson about my problem and they sent me an Ink Consumption Fact Sheet for this printer.

Very briefly this sheet states that "Certain operating factors will lead to heavy ink consumption and subsequent ink-end detection. Any action that leaves the printhead 'uncapped' (i.e.power off with the printhead not in the 'home' position) will result in the printer performing a cleaning cycle at the earliest opportunity to prevent head blockage. The process of 'capping' leaves the printhead in a condition that prevents head clogging, thus minimising any cleaning required." The sheet then lists some of these factors, and finishes by stating that "To avoid any unnecessary cleaning cycles, always press the PAUSE button .... cancelling print jobs or switching either the PC or Epson Stylus 800 off."

This problem was not mentioned in your review of the Epson Stylus 800 (RISC User 6:9), and in my opinion makes it unsuitable for casual users who may not know or may not remember that they should press the PAUSE button before cancelling printing or switching off. This is a great pity as the print quality of the Stylus 800 is excellent.

G.N.Ward

It is clear that users need to be aware of circumstances which lead to the operation of the cleaning cycle and the steps to be taken to avoid this happening. The most important is to press the PAUSE button before aborting printing, before switching off, and possibly before resetting or switching off your computer system or the Stylus 800. In addition, it is always prudent, with any printers using liquid ink, to carry out as much of your printing in low resolution graphics or draft text modes to extend the life of an ink cartridge. Mark Sealey, our reviewer, agrees that the printer's ink consumption is on the heavy side, but feels that this is more than compensated for by its superb print quality.

BASIC IN A WINDOW

This is a plea for one of your programmers or readers to produce an application which I, and I think others, would find invaluable.

I and several students write lots of programs in Basic. I often use the task window in conjunction with DeskEdit to develop, debug and run programs. However, this is useless when using graphics. It means that I have to leave the Desktop to run the programs. What we need is a Basic Window which will allow programs to be loaded, listed and run as in the Task Window, but which will also support the plotting of graphics within the window instead of onto the screen.

It would be so much easier to make programs run on the Desktop this way. There are loads of small programs, particularly in education, that aren't worth the effort of rewriting as proper Wimp programs, but would be very useful in a window when you could transfer between them and any other windows at will.

Christopher Binge

Well, that's quite a tall order, particularly when it comes to handling graphics and modes. Maybe some of the more competent Wimp programmers among our readers would like to take up the challenge.

PRINTER PROBLEMS

If it is not switched off first, my Star LC-10 printer does some unpredictable things when I shut down my computer system. Sometimes it continues to print interminable characters afterwards, even when physically disconnected from my A5000, until power is switched off at the mains. It does not happen every time, but the problem is waiting to pounce when I least expect it - almost like a virus, but one I have had from the day I bought the A5000.

*So I was more than grateful to have found a means of at least reminding me to switch off before shutting down using the program suggested by Alan Wrigley in **Just a Page** (RISC User 6:9). It works a treat.*

However, I still get problems with a number of applications hanging up if I forget to switch on the printer before starting up, and it leads me to suggest that perhaps someone somewhere can come up with a boot application which will give a similar reminder as that for shutting down as mentioned above.

*Although it seems that the ADVAL(-4) idea suggested in a previous **80 Column** article does not work when detecting whether the printer is switched on or not, there must surely be some way of doing this.*

What I envisage, if possible, is a single application which, on booting, will first detect and warn if the printer is not switched on, and then lie dormant until the shutdown procedure is started. Am I asking too much? Certainly, the shutdown application is a gem for me.

E.A.Allchin

One point to note is that most printers have a buffer, the latest printers quite large ones. So while a printer may be be disconnected from the computer, the printer will continue to print the contents of its buffer. As Mr.Allchin suggests, often the only reliable way of stopping this is to switch the printer off.

It is difficult to diagnose the reasons for any extraneous characters being sent to a printer. It could all depend on what other programs or applications have been run, and what state they have left the system in. *The 80 Column* did describe a method of detecting whether or not a printer is on line using ADVAL(-4) in RISC User 6:4. This was an update for RISC OS 3.1 of previously published information.

Finally, if any readers can submit ideas or code which will help Mr.Allchin, we would be delighted to publish this if appropriate for the benefit of others.

ARXE HIGH DENSITY DISC INTERFACES

I bought a high density disc interface from Arxe Systems some while back, and up until now it has functioned well. I am now getting problems from the HDI card, such as "No Disk in Drive" and "Disk Protected". I can read files but it will not let me format or write files; it will not even let me delete files. I thought it might be the drive but the problem occurs on both 3.5" and 5.25" drives. The problem has not affected the ADFS or IDEFS. I tried to contact Arxe Systems only to find that they are no longer trading. Does anyone know what the problem may be, or when another company is going to bridge the gap to allow older machines like my extensively upgraded A310 to use the 1.6Mb format under RISC OS 3? While on the subject of filing systems, I thought that being able to operate three or four filing systems at the same time was one of the advantages of the Arc. So why is it that some software still insists on making direct calls to ADFS::0? It would also be nice to see !Install applications for hard drives - a couple of recently purchased games had them on disc - thank you 4th Dimension. Even Acorn didn't seem to make any provision for using other filing systems with the PC Emulator. The IDEFS can be set up and runs with no problem. I am a little miffed that I can't get it to recognise Arxe Systems QUADFS, as it gives 1.44Mb and 1.2Mb formats (when it's working).

Malc Gambrill

Can any readers help with Mr.Gambrill's problems with Arxe Systems. Other companies are working on high density disc interfaces for the older Archimedes, and indeed our own RISC Developments should have just such an interface ready by the time you read this. As for software working with any filing system, well written software does this anyway; otherwise it is either laziness or an oversight on the part of the programmer.

PIN BOARD

CALLING ALL FAX PACKS

I have just purchased a Computer Concepts Fax Pack. I would like to exchange data or information with any other user. My fax/phone number is 0651 891787 and I leave the machine on line 7 days a week 6am to 11pm.

I am particularly interested in any Acorn user who has written a RISC-based Bar Code reading or printing application as I find the ones available in the MS-DOS world either under-powered or far too expensive for my taste.

For those readers without a fax machine, CC's Fax Pack also works just like a normal answering machine (only you will have to talk for 35Mb to time out....!)

Tom Waller (Aberdeen area)

BUSINESS CONTACTS WANTED

I would like to contact any interested Archimedes users within the Brighton area regarding an exchange of hints, tips, etc, especially business users.
Graham Hobson, Concord House, 18 Margaret Street, Brighton, Sussex BN42 4WE, tel. 0273 885728, fax 0273 701172.

CALLING ALL PROGRAMMERS

I am an educational software writer and designer who just can't keep up with the Arc! I'm looking for several programmers - good hobbyists, not professionals - to work on a series of projects involving animation and sound. You'll need to be able to write reliable code, in Basic or C, that runs on the Desktop - some artistic ability would also help! All earnings will be split equally. If you are interested give me a ring on 0246 204126 anytime.

Marshal Anderson

HELP WANTED WITH MORLEY TELETEXT ADAPTOR

Some years ago I bought a Morley Teletext adaptor for my BBC micro, and subsequently wrote a carousel program to download and store multiple pages for later leisurely reading.

On upgrading to an Archimedes I converted the program to sit at the end of the Morley's Archimedes software, which instead of being in ROM, as on the BBC Master, is now in Basic. However, it transpired that the Morley software did not download sub-page numbers. Morley kindly supplied me with the two or three necessary lines of the form:

```
2680 !ICblk%=8:SYS"IIC_Control",
&22,ICblk%,4
```

and all was well. Sadly my hard disc crashed fatally recently, and I found to my dismay that my backup copy of my carousel program did not contain the new lines, nor do I have any hard copy of them. The Morley programmer has now moved on, and they are unable to help. Can any readers come to my aid - there must be numerous owners of Morley adaptors who could use this information.

Peter Vasey

If any reader can help, then please write c/o RISC User and we will forward any replies to Mr. Vasey. We will also publish any useful feedback in RISC User.

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Extra discs cost £69 +VAT (£81 inclusive) each.

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RISC *user* Public Domain Library

Our Public Domain discs contain as near as possible to 800k (and not less than 700k). Each disc includes a 'Read Me' file, and instructions are included with the programs. The discs are offered as seen and are available to RISC User members only for the price of just £1.60 each.

January/February 1994
★ NEW ★

PUBLIC DOMAIN SPECIAL COLLECTION

These discs are still available at the standard price of £1.60 (inc. VAT and p&p). PDX1

PDX1	**Draw Plus**	Extended Draw
	Label	Label printing
PDX2	**AddressD**	Address labels
	AGP	Advanced graph plotter
	Daily	Screen clock
	Draw Cross	Crossword generator
	Memphis	RAM filing system
PDX3	**ArcFS**	Decompression utility
	Risc BBS	Bulletin Board system
	Impulse II	Inter-task communication
PDX4	**ArcFS**	Decompression utility
	PVray	Ray tracing
PDX5	**Hangman**	Classic game
	Interface	Classic Wimp display
	Menus	Wimp menu editor
PDX6	**SuperGram**	Sophisticated anagram finder
PDX7	**365 Days**	Thought of the day
	Dissi	Disassembler
	Eazicopy	Disc copier
	FileTree	Analyses directories
	FileUtils	Icon bar utilities
	GateKeeper	Virus protection
	IconMatch	Pelmanism game
	Interfero	Virus protection
	Links	Software application links
	Manager	Disc indexing
	Menon	Application launcher
	PackDir	File compaction
	QMC	Mode change utility
	Scanner	Virus protection
PDX8	**AIM**	Image processing
PDX9	**Process**	Image processing applications
	Translator	
	Creator	
	GreyEdit	
PDY1	**Powerbase**	Database Management
PDY2	**Out to Lunch**	Screen saver
	KeyWindow	On-screen keystrip
	TemplEd	Template editor
	Menon	Application launcher
	BlibII	Basic V library management
PDY3	**Zap**	Text editor
	ArmSI	Speed indexer
	ArcTools	50 star commands
	Glazier	Template editor
PDY4	**DemoFX**	Graphical effects
	Tertis	Classic game

The software on PDX1 to PDX5 was described in RISC User 5:7 (June 1992), PDX6 and PDX7 were covered in RISC User 6:3 (Jan/Feb 1993), PDX8 in RISC User 6:7 (June 1993), PDX9 in RISC User 6:9 (Aug/Sep 1993), and PDY1 to PDY4 in RISC User 6:8 (July 1993).

A full list of PD software is available in return for a SAE from RISC Developments, 117 Hatfield Road, St Albans, Herts AL1 4JS

PDY5 - Dinosaw Game

This is the latest PD game from the prolific Tom Cooper. Use your chainsaw to chase and dispatch the dinosaws (sic) in this topical platform game. Additional applications allow you to redefine the keys used by the game, and to shoehorn Dinosaw into a 1Mb machine.

PDY6 - Son of Gyrinus

This is another of Tom Cooper's excellent PD games in the style of a graphic adventure. As a scientist you must explore the laboratories, collecting flashing crystals while avoiding all the usual gruesome baddies. Full instructions are included on the disc.

PDY7 - Lemings

No, this is not a certain well-known game, though you may see similarities. This highly addictive game is also by Tom Cooper which guarantees quality and interest. All the resources required by the game are included, and the disc is very full indeed.

PDY8 - Games Collection 1

This disc contains nine different games (with two versions of two). Games include the icon bar BallGame, PV_Life, Racer and ShootEmUp, plus MineHunt, William Tunstall-Pedoe's Billion games, the evergreen PlanetLand, an excellent darts, and the fiendish Taipei. Fabulous fun for all the family.

PDY9 - Games Collection 2

Our second collection of PD games places more emphasis on mental skill with Yatzy, Solitaire, NoughtEx and MastMind. There are two shape games, Bloxed and CTetris, and the intriguing Merrills - all good entertainment and amusement.

Many of the games on these discs were described in more detail by Simon Burrows in his PD survey, Select and Collect, published in RISC User 7:3

TECHNICAL QUERIES

Alan Wrigley answers your queries on error trapping, font handling in applications, disappearing 3D icons and repetitive operations.

Q *Dear Sir*
Some of your magazine disc programs have error trapping which allows the user to click on OK to continue or on Cancel to quit the program. When I try to implement this in my own programs, clicking on OK goes into an infinite loop giving an "Out of data" error. What am I doing wrong?
Darren Walters

A When incorporating error trapping routines into a program, the location of the trap can be quite crucial. When an error occurs in a Basic program, the operating system looks to see if an ON ERROR statement has previously been encountered. If so, the remainder of the ON ERROR statement is executed, and then control is returned to the point immediately after the ON ERROR. For example, if your program includes the following lines:

```
ON ERROR PROCerror
PROCdosomethingelse
....
```

then provided these lines have already been executed, each time an error occurs *PROCerror* will be called, after which the program will continue from the line which calls *PROCdosomethingelse*, irrespective of where in the program the error occurred.

If *PROCerror* merely reports the error and then calls "Wimp_CloseDown" and exits, there is no problem. But if you want to continue after the error, you have to think carefully about where to put the error trap. From your description it sounds as if you have put the trap near the start of your initialisation routine, followed at some point by a line or lines which READs items from DATA statements. After an error, these lines will be executed again, and unless the data pointer has been reset to the beginning, an "Out of data" error will occur because there will be no more data to read.

The best place to put an error trap in a Wimp program is in the main body of the program immediately before the poll loop, and to use a WHILE...ENDWHILE poll loop. Assuming that this will terminate when *quit%* is TRUE, you can then arrange the error-reporting procedure to do nothing if *OK* is clicked, or to set *quit%* to TRUE if *Cancel* is clicked. So the start of your program might look like this:

```
PROCinitialise
ON ERROR PROCerror
WHILE NOT quit%
  REM poll loop here
ENDWHILE
SYS "Wimp_CloseDown":END
```

Q *Dear Sir*
Your Font Manager application (RISC User 6:9) works fine with Draw and Edit but it will not load any extra fonts into some other applications. If I need any different fonts once I have started work on a document I have to save it, reset the machine and install the new fonts before restarting the application. Am I misunderstanding something?
B. Daulton

A In the early days of RISC OS, there was a limited range of fonts, and pretty well all applications were written in such a way that the list of installed fonts was read only when the application was initialised. Not only this, but many applications, including Acorn's own, limited the number of fonts that could be handled and would crash if there were too many. The enormous proliferation of fonts since then, and the need to parcel them up into separate font directories to stop the whole process getting out of hand, was not anticipated.

More recent software, such as the RISC OS 3 versions of Edit and Draw, have addressed this problem and can now respond dynamically to changing fonts, as you have found. Unfortunately, many of the older applications still read the font list at the time of starting up and assume that this will remain constant. This means that you have to quit and re-run the application if you want to change the font list. It shouldn't be necessary to reset the computer, though, since Font Manager allows you to add a font directory to the font path by double-clicking on the appropriate font application, whereupon it will be added to the list of known fonts when the application starts up again.

For an alternative approach to handling large numbers of fonts, see the review of LookSystems' *Font Directory* elsewhere in this issue.

Q *Dear Sir*
I have recently acquired Acorn's **NewLook**, *which I find very attractive, but sometimes after I have been using the computer for a while, the pretty 3D arrow icons disappear and are replaced by the old non-3D arrows, which are the wrong size and overlap each other. Is there a bug in NewLook?*

N.J. Sly

A This is not due to a bug, but to some other application in your machine which has not been correctly written. The sprites which are used for the arrow icons, and other common icons such as radio buttons, are placed into the Wimp sprite pool by *NewLook*, from where they are available for use by all applications. When any application is first seen by the Filer, the contents of its !Sprites file are also put into the Wimp pool. The purpose of this is so that the application's own icon, plus those for any filetypes it "owns", are recognised by the system in future. Under normal circumstances these are the *only* sprites you should include in a *!Sprites* file; any others must be put into a *Sprites* file (note the subtle difference in the name) and loaded into the program's own private sprite area.

It is possible, though not sanctioned by the Style Guide, for programmers to use their own sprites for arrows, radio icons etc., provided they use them *only* in their application and do not put them into the Wimp pool. Unfortunately, some software writers use the *!Sprites* file as a lazy way to make use of their own sprites, including re-definitions of some of the standard sprites. This should *not* be done - it can be very annoying to users, and in any case setting up a sprite area for your own sprites is very easy. If you open a directory viewer containing such a rogue application, its sprites will overwrite any of the same name in the Wimp pool. This is what will have happened in your case - the arrow sprites have been redefined by an application's *!Sprites* file.

The solution is to go through all the applications you own and examine the *!Sprites* file, deleting any sprites which redefine standard ones (and repeating the process for the *!Sprites22* file if there is one). Common names to look out for are *up, down, left, right, radioon, radiooff, opton* and *optoff*. If you are using a hi-res monitor and have the hi-res sprite option set, then you could also look for any filetype sprites that define standard filetypes in low-res format. A common one is *file_aff* (Draw file) - this was not defined in ROM in RISC OS 2 and so many applications included its sprite in their *!Sprites* file. If there is no corresponding hi-res icon defined (i.e. in a *!Sprites22* file), the low-res sprite will overwrite the hi-res one already in the Wimp pool.

Q *Dear Sir*
I have come across a problem regarding Masterfile III that I don't quite know how to tackle. I have a field in which I want to change all the "Y"s to "N"s throughout the entire database. Is there any way of doing a type of find and replace?

A.E. Hayes

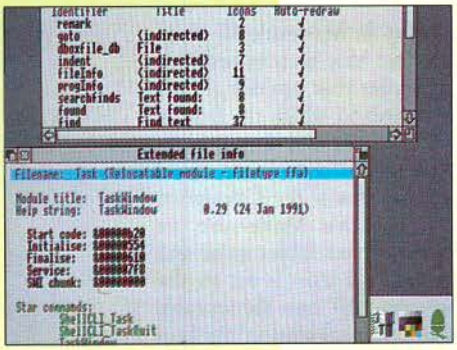
A There is a facility in Masterfile III to do this, but it may not have been immediately obvious that it could solve your problem. If you create a subset of records in which the field in question contains "Y", you can then use the Calculation option to set the contents of a field within that subset. First choose the *Calculation* option from the *Misc* menu. Make sure the Subset icon shows the correct subset name and that the Calculation field icon is set to the correct field. Now enter "N" into the writable icon and click on OK. The contents of the field will be changed for every record in the subset. If you have more than one field in each record that needs changing, then you would have to repeat the process for each field.

This raises a general question about repetitive operations in RISC OS applications. Often there is a method built into the application to do such things, as described above with Masterfile. But in many cases there is no short cut, and the whole process must be carried out laboriously by hand. Because RISC OS is multi-tasking, however, it is often possible to write separate applications which can take over some of the workload by generating repetitively the necessary key presses and mouse clicks etc. Examples of such programs are Keystroke (reviewed in RISC User 6:10) and TextAid (RISC User 6:1). In some cases you can also use the global search/replace facility in Edit, provided you understand the format of the file. By assimilating the information presented in articles such as *Mastering the Wimp* and *Wimp Topics*, it would not be too difficult to write your own small utilities to perform specific operations of this sort. Remember that if you come up with anything that could be useful to others, RISC User pays for contributions to its monthly magazine discs.

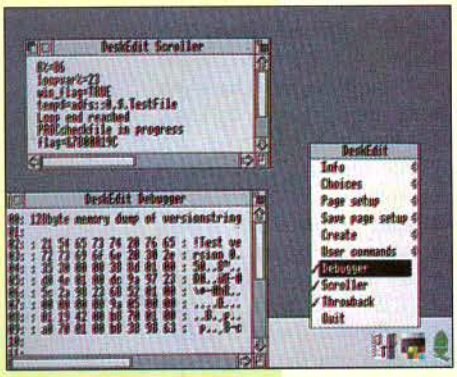
More editing power with . . .

DeskEdit 3

DeskEdit 3 is the successor to the popular DeskEdit 2 program and text editor, and at no increase in price. DeskEdit 3 thus offers even more value for your money than ever before. DeskEdit 3 retains all the features of its powerful predecessor, while adding many more.



Extended info on templates, sprites, modules and other files



The user Scroller and Debugger in action

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RISC developments

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Clip Art Selector

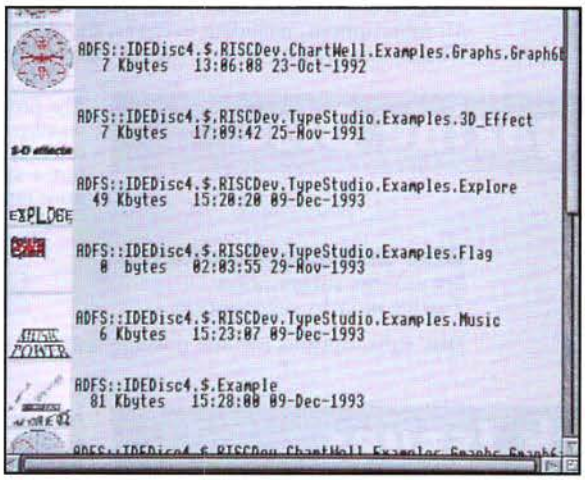
by Alex Hayward

The Clip Art Selector is designed to help with the management of libraries of Draw file clip art. Draw files can be dragged to the Clip Art Selector window and will then appear in miniature. These can be viewed much more quickly than it would take to load each file separately into Draw. Dragging any one of these minatures to a Draw window will cause it to be loaded at the position of the pointer, or you can double-click on a miniature in the Clip Art Selector window to load it into Draw.

Several menu options are available: one of these allows the Clip Art display to be in any one of three styles, similar to the three display modes provided by the Filer. Selected clip art files can be saved either as a Draw file, if only one is selected, or as a Clip Art Selection file. The *Find* option will select all files with a specified name, while *Update* redraws the selected files ensuring that any changes made to the Draw files stored on disc are reflected in the pictures displayed by the Clip Art Selector.

While the Clip Art Selector is designed to work with Draw files, you should remember that any sprite can be dragged into a Draw window and saved as a Draw file. Thus both Draw and sprite files can be catered for.

At a time when most users have ever increasing libraries of clip art, this application provides an excellent way of cataloguing, displaying and retrieving images.

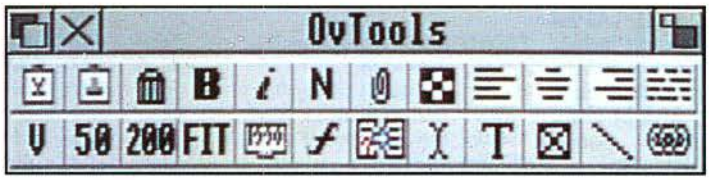


Ovation Toolbox

by Ian MacDougall

This application will be a boon to all Ovation users, providing a handy Toolbox to be used alongside any Ovation document. The Toolbox provides 24 different tools, displayed within a small window, which can be positioned where required or clipped to the current Ovation document.

The 24 tools include many of the commonly used Ovation functions, but in Toolbox format to avoid the need to move down several layers within a menu structure, or to remember what might seem to be obscure keyboard shortcuts.



The Toolbox can be oriented either vertically or horizontally, and the positions of all the tools within the Toolbox can be changed to suit the needs and convenience of the user. Some of the tools provide two separate but related functions, depending on whether they are activated by the Select or the Adjust button. For example, the scissors icon will copy any highlighted text to the clipboard if Select is used, or cut any highlighted text if Adjust is used. Other tools provide direct links to Ovation's spelling checker, and to RISC Developments' Desktop Thesaurus (if loaded), plus many other commonly needed functions.

This is an application which many Ovation users have requested, and is available on this month's magazine disc for RISC User readers.

For reasons of space, both of these applications appear only on this month's magazine disc.

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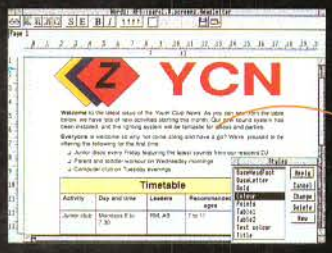

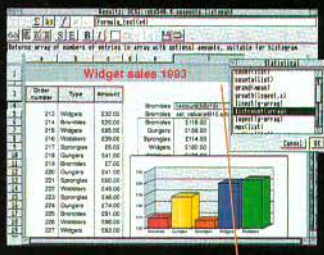

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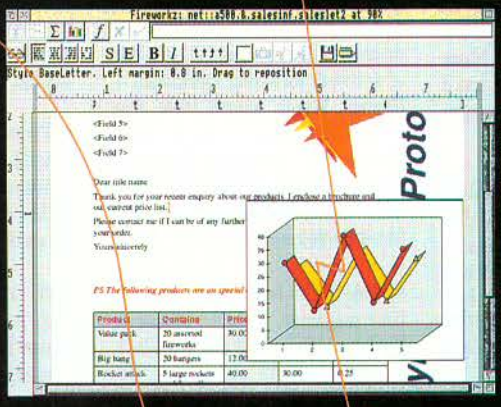

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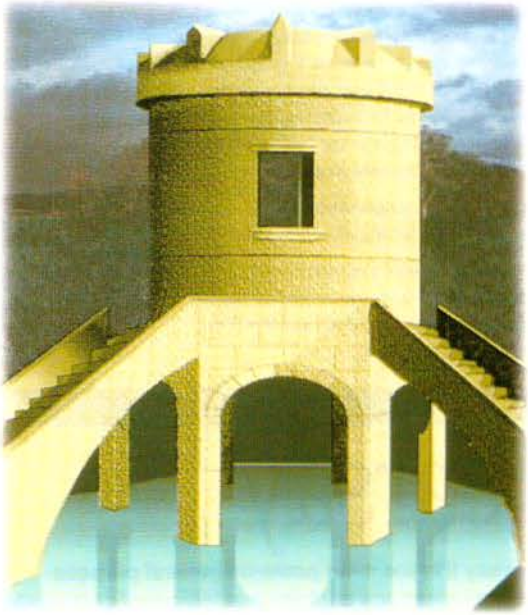

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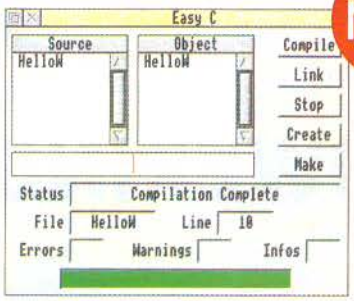

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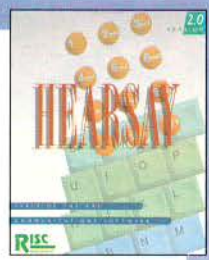

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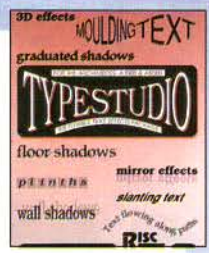

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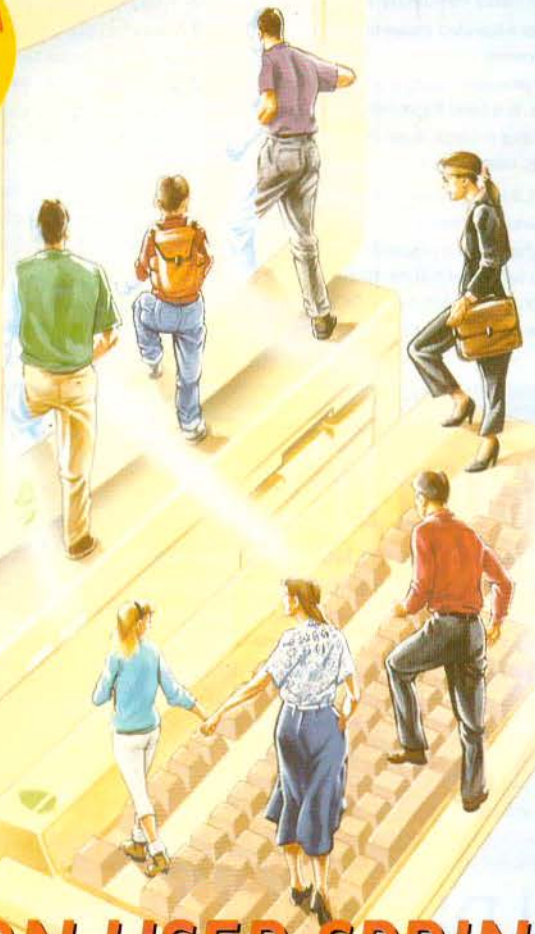

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